THE

SOUTHERN AGRICULTURIST.

JUNE, 1837.

PART I.

ORIGINAL COMMUNICATIONS.

The Traffic of Bond with Free.

Santee, March, 1837.

Mr. Editor,—Believing it our duty and interest to render the lives of our people as comfortable as their situation will permit, I would call the attention of your readers to a subject which legislation has in vain endeavored to control—the trade of bond with free.

A portion of land is generally allowed to each negro for his own cultivation in his leisure time. From this he makes corn, rice, cotton, or any other product adapted to the soil. Amply supplied with food, the first object of the negro is to exchange this crop for some of the luxuries of life; fine clothes, bacon, sugar, coffee, tobacco, and molasses. These are sometimes procured with the consent of the owner, who furnishes him with a ticket to sell and purchase. The trouble to both parties attending this custom, has nearly rendered it obsolete, and the negroes generally, prefer to sell and buy clandestinely; the amount and nature of their purchases are thus unknown to him. That this trade is both lucrative and extensive, cannot be doubted. Few arbitrary governments have ventured to enact more severe and penal statutes than those of South-Carolina, to prevent the unlawful traffic with slaves, and no laws are more completely a dead letter. The necessity for concealment places the negro entirely in the power of the tradesman; however defrauded, he has no redress; the prices of his sale and purchase depend on the will of the tradesman, and except in towns

there is seldom a choice of stores. I have heard it related that, many years since a country storekeeper, not far from the sea-board, quarrelled with his clerk, who reported his illicit traffic to the Attorney General, and on the trial deposed; that the trader always weighed one pound of cotton brought by the negroes for sale with a two pound weight, and then allowed them 6¼ cents per lb., and this at a time when long staple cotton was selling at 50 cents.

Laws cannot avail to check a practice, when it is the interest of all concerned to evade the law; if the evil can be removed, it is only by rendering it the interest of one of the parties to abstain from the traffic. This remedy, far more efficacious than courts and juries, is entirely within the power of the planter himself. Not by telling his negro, that although he allows him more food than he can consume, and land enough to produce double the quantity, yet that he must avoid all means of disposing of this surplus, and suffer it to perish on his hands; for this is virtually the language of every planter, who permits his negroes to plant for themselves, but does not furnish them with the means of selling their produce. The negroes seldom ask for tickets, as it subjects them to an inquiry from the owner or manager respecting the amount of produce to be sold, and the articles to be purchased in return; the law requiring that these should be specified in the ticket. The remedy for this evil is simply for the planter to put himself in the trader's place. Let him purchase such goods at wholesale as his negroes require, retail them to his people at their original cost, give them the full market price for their produce, and he will soon drive the illicit trader from the neighbourhood. Though not skilled in arithmetic, the negroes will soon learn the advantage of procuring, for half a bushel of corn, two handkerchiefs from their owner, instead of one from the storekeeper. The articles which they purchase most largely are handkerchiefs, white and colored homespun, calico, red flannel, check, bacon, molasses, and soap. Much facility in this business arises from keeping a regular book of entries, alphabetically arranged; this can be done by every planter who understands his factor's accounts. By carefully entering dates and amounts, and giving no credit, the time thus employed does not much affect the interests or comfort of the planter, whilst it materially promotes those of the slave.

Method and arrangement are indispensably necessary in every commercial transaction. The first step in this business is to ascertain the articles required, arranging the people's names alphabetically on the left hand of a sheet of ruled paper, and drawing perpendicular lines over the remainer of the sheet. At the top of each of these lines the article required should be written, and in the square below, the number of yards wanted is inserted opposite the name of the negro sending for it. Adding up the numbers in each column gives the quantity required of each article. Their produce and its value is entered on the credit side of their page in the account book, after which the value of the goods delivered is inserted on the opposite side: if any balance remain in their favor after the trade in dry goods, it is easily liquidated by giving them its value in soap, molasses, or other articles that may be divided, to meet the exact amount.

This custom has been objected to, because it may encourage those to steal who can thus procure a ready market for the sale of their plunder. Were neither stores nor coasters to furnish this facility, it is not probable that the negro would steal very largely, when his only market is with his owner, the sufferer. Additional security arises from a general custom of furnishing them with seed of a different species from that cultivated by the owner, who can thus easily ascertain whether the produce offered by them is fairly acquired.

There is but one valid objection to this system; it gives trouble. But is not the object attained worth that trouble? Could it be made general, the illicit trade would cease. My own experience of twenty years, and that of my predecessors for double that period, satisfy me, that in addition to the advantages already stated, it strengthens the bond of union between the master and his people. The sacrifice of our own time and attention to promote their comfort, is not in vain. They are susceptible of gratitude for favors repeatedly bestowed; and this one does not come under the doubtful head of privileges and indulgences that encourage idleness and discontent. It brings the reward of their surplus industry within the reach, and removes or diminishes the temptation to that illicit traffic which is the opprobrium of legislation. It averts the danger which attends this traffic, when carried on in vessels; the numbers who crowd the canoes to

board the coasters at night, encounter some risk, increased by the use of ardent spirits, which is frequently the chief and leading article of the contraband trade.

Yours respectfuliy,

C. C. PINCKNEY.

The following communication was sent to us, during the last season, but has been misplaced until the present time. We hope, however, it will be found acceptable in this number. EDITOR.

Potatoes made without Tillage after Planting.

Mr. Editor,—Mr. James Camak's communication to the New England Farmer, republished in your last number,* deserves well of your friends the planters, in recommending a trial of corn cultivated by covering the hills with dead leaves, instead of hoeing or ploughing them to kill the grass. I think his plan peculiarly adapted to the hot sun in Georgia and South-Carolina, and the cultivation of sweet potatoes. No plant suffers more from grass than sweet potatoes; and none is injured more in its growth, by disturbing the roots and vines. As this is the season for potato slips and grassy fields, I earnestly request that the experiment may be made by some of your numerous correspondents, and the result communicated to us in your November number,—whether with or without success. I am the more inclined to think favorably of this plan, because I have reason to believe that covering the beds three or four inches with pine trash will not only kill crab grass and weeds, but nut grass also.

Beside the forcible observations of Mr. Camak, let me ask if two of the most frequent sources of injury to a crop of slip potatoes, may not be prevented by this covering of trash or dead leaves. Would not the destructive effects of drought, be in a great measure obviated by this covering; and would not the beds be equally protected from the deluging heavy falls of rain, which sometimes wash the earth away from the potatoes?

Is it not common for the crop of slips to be delayed too late in planting, by a spell of dry weather, and sometimes very much injured or lost? A covering of pine trash

* Southern Agriculturist, vol. 9, p. 316.

or leaves would enable the planter to make up his beds, and set his slips, whenever his potato vines were sufficiently grown, and the crop rendered certain. Let it be tried, if not on a field, on a task,—at least on three or four rows in a task. What can be a finer preparation for a winter crop of oats, rye or wheat, than a field so covered?

Q.

Reply to Beaufort's Six-acre System.

Mr. Editor,—At your solicitation I have been again induced to stand up before the lance of Beaufort. The fact is, he wages battle with so much of the gallantry and good humor of a true knight, that I declare to you I deem it an honor (doubly increased by the awkwardness with which I appear) to have him doff his glove to me. One word, however, by way of correction of a misapprehension into which Beaufort seems to have fallen. He thinks, that he can detect the gown of another profession peeping forth from beneath my farmer's frock; and that by contending with me, he runs the risk of being hung up in chancery. He is wrong. He does me too much honor in supposing that I wear any other than the simple farmer's frock; and he underrates my independence of opinion, when he fears that I would call to aid a court of *chancery* to wind him up in its intricacies. The science of agriculture is unfortunately too uncertain already, without adding to it the "glorious uncertainties of the law."

As Beaufort commences battle under the consoling motto, that, "thrice is he armed who hath his quarrel just," I might as well encourage myself with another equally appropriate motto, "he wants not sword or shield, whose soul is cased in *truth*."

But to the contest.

In one of my former articles, I distinctly stated, that all my arguments should be based upon the supposition, that the land upon which our respective systems were to be practised, needed no manuring. In our part of the country, our lands are generally of such a description, (except on our new lands, and there is little of this,) that our fields require high manuring every year, they are planted. I shall not ask Beaufort what he has done; but with the greatest attention, and the strictest economy of

time and labor, I have never been able to manure more than five acres up to the *productive point*—to each hand I mean. This Beaufort seems to grant me, when he says, "I never recommended the six-acre system for universal practice; but limited it expressly to such plantations as could furnish the quantity required, of land unexhausted, or manured up to the *productive point*." I know not how it may be with Beaufort; but with me I have no land manured up to the productive point, but such as is too new and full of stumps to be attended with the plough. To continue this controversy any further, would be only to repeat what has been already advanced in my former articles. Let me, in conclusion, assure Beaufort, that I feel no prejudice against his system, which, if practicable, must be one greatly to be desired by all planters. I have tried it once, and have failed in it. It may have been from improper management; but that I may give it a fair trial, I have devoted a portion of my field to the experiment this year, at the conclusion of which, if Providence permits, I shall let Beaufort hear from me again.

With a high appreciation of the polished and urbane manner in which I have been answered by Beaufort, and with the most unaffected respect for the enlightened district which he represents, I remain his most obedt. servt.

COLLETON.

Remarks by the Editor.

Beaufort has been pleased to call Colleton our "champion." We think it will be admitted upon all hands, that he has done us honor in making us such an appropriation. If Beaufort will force us to speak, we must confess that our notions respecting over planting run somewhat parallel with Colleton's. We have ever been of opinion, that where lands are poor it is better to plant a few acres to the hand, and manure those highly, than to plant largely and manure, but, insufficiently. Indeed, Beaufort seems to be of this opinion himself; and we think after all, that, the point of difference between himself and Colleton is not so wide, as either of them are led to believe. Colleton seems to have come to this conviction himself; for, he has discharged his last shot with a devoidness of rancor, which seems to evince a becoming readiness to shake hands and make friends. If we may be allowed to form any

opinion of the frankness of Beaufort, from the style of his writings, we think we can with much safety congratulate our readers that a reconciliation will take place. A word however, to our antagonists. In our more romantic days, we somewhere read, that when two knights met in combat, and when both were so equal that neither would yield, if a third came in, and reconciled them, it was the custom for both to devote themselves to the mediator as his mutual friend. May we hope that there is still enough chivalry left for Beaufort and Colleton to revive this ancient pledge; and may we not have the proud honor of announcing that for the future these champions of the plough will "no more be found opposed against acquaintance, kindred and allies," but will be seen fighting with undivided hearts, for the great interests of our domestic agriculture.

The Properties of Salt, as a Manure for Cotton and other Plants.

We perceive, that, the application of salt as a manure for cotton, is beginning to occupy the attention of many planters throughout the country. In several essays, which we have recently published, we have given some account of this valuable manure as applied to the long staple or sea-island cotton. Some of our correspondents have inquired, "whether salt has ever been applied as a manure, with equal success to the short staple cotton?" In the last number of the Farmer's Register, we also find the following remarks from its able editor, upon an article extracted from our journal:

"It seems to us that salt must act as a specific manure for cotton, and is essential to produce the fineness of fibre that constitutes the value of the sea-island cotton. As different as is the quality and appearance of this cotton from the green seed, or short staple upland cotton, they are but varieties of the same kind, the most valued of which, rapidly runs into the other, by mere change of soil. The one kind is raised, in perfection, only on the low sandy islands on the coast of Georgia and South-Carolina, and the adjacent shores of the main land. If the seeds, (which are naked and black,) are planted in

the interior, though but little remote from the sea, the product is what is called the "long staple Santee," a green seed cotton, but of longer fibre than the ordinary upland cotton, into which, however, continued planting from the same, finally brings the crop.

"It has been supposed that the very sandy nature of the soil of the sea islands was the cause of the peculiar value of the cotton they bear. But if so, some spots at least, might be found equally sandy, in the interior of the country, and the same kind of cotton there produced successfully. But the account we have in the foregoing and other articles, of the peculiar value of salt mud and salt grass, as manures for cotton, indicate plainly that salt itself is necessary for the perfection of cotton, and that it is owing to the salt already in the soil of the sea-islands, and the adjacent low coast, that to such narrow limits the production of that valuable variety of cotton has heretofore been confined."

It is with pleasure that we are able to furnish the information desired. *Salt* has been applied with great success to both kinds of cotton; and wherever and whenever applied, has been found to improve the staple and yield of those plants. Salt mud, salt marsh, and salt sand, have been, for many years back, applied to the cotton lands of our sea-coast. In every instance, the result has proved beneficial. Convinced, that it is the salt contained in these respective manures, which constitutes their chief excellence, some planters were induced to try the common salt itself. In every instance where the trial has been made, it was found to act powerfully as a *condiment* to the plant; causing it to mature its fruit earlier, and, consequently, to produce a finer and more healthy staple. In several cases where the application of this manure has been made, the product of the field has been increased 50 per cent., and in no one instance have we heard of its falling below 15 or 20 per cent. No one passing by a field manured with this material can mistake its effect. Whenever the cotton comes in contact with it, the plant assumes a healthy green appearance, from its germination to its maturation. We speak in reference to both varieties of cotton. Indeed, we might as well, here observe, that in the cultivation of the two cottons there should be little, if any, difference. What is proper for the one, is also proper for the other; and, as a general remark, it

may be affirmed, that the same culture which will produce a good crop of the long staple cotton, will, when applied to the other variety, yield a double amount. This doubtlessly, arises from the greater hardiness of the short staple cotton plant.

This year, we have made several experiments with common salt, on our cotton and other plants. From the backwardness of the season, we have not, as yet, been enabled to come at any conclusive results as to its effects. One important experiment, however, we can mention. Around several cotton plants, infected with bugs or worms, we applied common salt, in quantities from a tea-spoonful to a table spoonful. In both cases, the bugs or worms were forced away from the plants, and in three days afterwards, not a vestige of them was to be found. Where the table-spoonful of salt was applied, the cotton has greatly suffered, and will, we think, die, from the quantity of salt applied being too large. Where, however, the tea-spoonful had been applied, the plants have assumed a beautifully healthy and vigorous appearance. Our mistake in applying the table spoonful, was, that we applied it too immediately around the young and tender plants. Had we scattered the salt between each plant, so as to divide its power, we are inclined to think that the effect would have been otherwise. Neither the tea or table spoon should be filled up to what is called a heap. That salt will drive away bugs and worms from plants, we have also tested, by a very simple experiment, in our garden. Having several beds of very fine cabbages taken by grubs, we applied salt-mud around the roots of the plants. In one night after thls application, not a grub was to be found upon the bed. That we might be sure of the effects of our experiment, we left one bed, without applying any mud around the plants. In this condition, we left it for about a week; at the expiration of which time, the grubs had eaten down almost every plant to the root. This bed we again transplanted, taking the caution to apply the mud as around the other plants; not one of them is destroyed; and they continue to grow as luxuriantly as any plants we ever saw.

It is the custom of some of our planters of the sea-coast, to soak their cotton-seed in salt water previous to planting. They say, it prevents worms and insects from at-

tacking the plants when young. But, of the truth of this, we can say nothing practically.

Corn Rusks.

In a late number of the Baltimore Farmer and Gardener, we read a receipt for making corn rusks, which, in the simplicity of our hearts, we extracted into our journal. It appears that some of our readers copied the same into their scrap-books of cookery; and not a few went so far as to give it a trial. The receipt, it will be recollected, was as follows:

6 Cupsful of corn meal,
4 of wheat flour,
2 of molasses,
2 table-spoonsful (horrible to say) of sal æratus.

This receipt, the editor of the aforementioned paper recommended, as a "delicious accompaniment of the breakfast table." Instead of the sal æratus, it seems, he should have said, the *solution* of sal æratus. The omission of one little word has thus produced among the housewives a terrible commotion. All who have tried the receipt, declare, that their bread has been spoiled, and several of eur readers have threatened to visit the sin of the transgression upon our heads. We perceive that, our worthy friend of the Farmer, has got himself in the same predicament into which we so innocently put ourselves,—so much so, indeed, that one fair lady, who was led away by his mistake, declares that she will become unrelenting, until he consents to eat the rolls she was induced to make. Such a punishment would be slight, compared with what we are threatened. Let a candid public read a few of these threats.

Letter from a Lady, this side of *forty*.

To the Editor of the Southern Agriculturist.

Dear Sir,—A few days since, reading a receipt for making "delicious corn rusks," and expecting my friend Mr. Timothy Slender to sup with me, I was induced to give your receipt a trial. I did so, sir, and followed the prescription precisely as you gave it. Imagine my sur-

prise, when the rusks were brought on table, so impregnated with a sort of indescribable odor, as to be offensive to all the company. Now, sir, I am not ashamed to acknowledge to you, that I designed making a grand impression upon my friend's heart that evening; and I had supposed that your rusks would have afforded me the great opportunity of evincing my commendable domestic economy. It is enough, sir, for me to tell you, that I had every reason to suppose that Mr. Slender would have addressed me, in token of his admiration of the rusks. But, Sir, it is all over! What I thought would prove a fortune to me, only proved my ruin. No sooner did Mr. Slender taste the rusks, than he turned his mouth all sorts of ways, and, being a very polite man, had, literally to leave the room, so disagreeable was the mouthful. When you next hear from me, Mr. Editor, it will be with a bill for damages. I remain,

SOPHONISBA SPINSTER.

Another Letter.—From Miss Letitia Lacewell.

Mr. Editor,—You must either be a shockingly ignorant man, or a tasteless man, or a careless man, or a man who knows nothing about making corn bread. Who ever heard of putting two table-spoonsful of sal æratus in corn rusks? I told grandma it would spoil it; but she said you were an editor, and ought to know more than I. But she did'nt recollect that I had learnt chemistry from Mr. ——, and that I ought to know that so much sal æratus would make bread as queer in taste as you seem to be in disposition. I wish you were a single man, Mr. Editor, I would laugh you out of all the society of the girls for your mistake; and would then marry you myself, just to laugh at you the remainder of your life.

From a Dyspeptic Gentleman.

Mr. Editor,—If you are not regardful of the feelings and tastes of your readers, you should, certainly have some regard for their stomachs. I must be plain with you sir, and must declare, that I consider your receipt for making rusks as shocking as it is indigestible. I have not been a well man since I ate of them, and I must attribute one of the acutest attacks of dyspepsia I ever had, to your misdirected receipt. Yours, &c.

These are among some of the most mild of the letters we received. We could exhibit several, of a more severe nature; and we tell it with trembling, that one old testy gentleman, conceiving that we had hoaxed him, threatened to cudgle us soundly, and would, in all probability, have made the attempt, had not our devil, who was by us at the time, got us out of the scrape, by announcing, that a certain bank, in which our old friend was a stockholder, had failed. Thus were we relieved from most imminent peril. And never will we be placed in another similar situation, by meddling with a department, which, of right, belongs to our fairer friends.

The Crops.

Within the recollection of our oldest planters, the crops have never been known to be so backward as at the present time. They, indeed, seem to have been keeping pace with the depressed state of our commercial affairs, and, as if conscious, that there is little specie to meet their price, they have resolved to suspend their operations, until further advice.

To be serious, however, the unusual lateness of our spring, has put back the cotton crops later, by four or five weeks, than last year; and it is only within a week or two since, that the seed, with many planters, has sprouted from the ground.

It is, nevertheless, to be hoped, that Nature, always wise in her operations, will, in consideration of her late spring, force on vegetation to a proportionably early maturity. Planters who, this time last season, were making their third thinning of plants, are now scarce able to go over their first thinning; and should an early autumn frost come on, it is the general belief that shorter crops will be made than even last year.

The above remarks apply, as well to our corn, potato and rice crops, as to cotton.

In this state of things, let us give one word of precautionary advice. If our planters apprehend that their corn may not turn out equal to their expectations; let them prepare at once for planting largely and manuring highly for slip potatoes. A good crop of these roots will won-

derfully help them out of their difficulties; and will go far towards relieving them of that moth in the planter's pocket—the buying of corn.

Life and Character of Jethro Tull.

When we assumed the editorship of this work, we promised, that, we would occasionally furnish our readers with biographical notices of distinguished agriculturists, of this and other countries. We shall endeavour to redeem that pledge, by commencing, in this number, a series of articles on the subject. In doing so, we wish it understood, that we lay little or no claim to originality. Our object being rather to afford information, than to claim the credit of authorship, we shall, in every instance, where we can do so with benefit to our readers, draw liberally from whatever sources will afford us the opportunity.

As an appropriate commencement of the series, we begin with the life and character of the father of English husbandry,

Jethro Tull.

This distinguished father of British agricultural improvements, was of an ancient family in Yorkshire, and was born about 1680. After being educated at one of the English universities, he became a student of the Temple, and was called to the bar; but, instead of commencing practice, made the tour of Europe, and, in every country through which he passed, was a diligent observer of the soil, culture, and vegetable productions. On his return to England, he married, and settled on a paternal farm, in Oxfordshire, where he engaged in agricultural pursuits with such zeal, that his health became endangered, and he was compelled to visit the continent for its recovery. After passing three years in France and Italy, during which he continued his observations on his favourite subjects, he returned to England, and, with an impaired fortune, settled on a farm of his own, near Hungerford, in Berkshire. He now determined, in spite of all opposition, to carry into effect, what he termed, his horse-hoeing method of culture; and, notwithstanding

the stupidity of some of his workmen in constructing the instruments, and the wickedness of others in destroying them, he finally attained his object. He succeeded in raising crops of wheat, in the same field, without dunging, for thirteen years together, equal in quantity, and superior in quality to those of his neighbours, who pursued the ordinary course; and thus demonstrated the truth of his own doctrine, that labor and arrangement would supply the place of dung and fallow, and would produce more corn, at an equal or less expense. The neighboring gentlemen, in consequence, prevailed upon him to publish the theory of his husbandry, illustrated by a genuine account of the result of it in practice; and accordingly, in 1731, he printed his first work, A Specimen Only, which was followed, in 1733, by his Essay on Horse-Hoeing Husbandry, in folio; a work of so much reputation, that it was quickly translated into French, by Du Hamel. From this period to that of his death, which occurred on the 3rd of January, 1740, he continued to make various improvements in his method of cultivating wheat, and to publish, at different times, answers to such objections as had been made to his new husbandry, which appear to have been neither few nor liberal. The persons who wrote against him on this occasion, indeed, seem to have been deserving of the appellation bestowed on them by a celebrated agricultural noblemen, who, in an advertisement to a posthumous publication of Mr. Francis Forbes, which endeavored to revive the ideas and practice of Mr. Tull, speaks of the individual in question as "those literary vermin that are as injurious to the agriculture of England, as the fly is to our turnips."

As the first Englishman, if not the first writer, ancient or modern, who attempted, with any tolerable degree of success, to reduce agriculture to certain and uniform principles, Mr. Tull is entitled to honorable commemoration. The benefits since derived from his improvements, among which may be mentioned the invention of the drill plough, show that his theories deserved more attention than they met with during his life-time. "He carried ploughing, says a writer in The Gentleman's Magazine, "to so great perfection, that he has, in some degree, rendered Cato's third direction *(stercorare)*, manuring, almost unnecessary." "Many, however," he adds, "grudged leaving so large intervals between the

ridges of corn, as Mr. Tull proposed." Besides other editions of his writings, one has been printed by the celebrated William Cobbett, including a memoir of his life.

In giving a short account of the innovations of this eccentric writer, it is not meant to enter into any discussion of their merits. It will not detract much from his reputation to admit, that, like most other men who leave the beaten path, he was sometimes misled by inexperience, and sometimes deceived by a too sanguine imagination. Had Tull confined his recommendation of drill husbandry to leguminous and bulbous-rooted plants generally, and to the cereal gramina only in particular circumstances; and had he, without puzzling himself about the food of plants, been contented with pointing out the great advantage of pulverizing the soil, in most cases, and extirpating weeds in every case, he would certainly have deserved a high rank among the benefactors of his country. A knowledge of his doctrines and practice, however, will serve as a necessary introduction to the present approved modes of culture.

Tull's theory is promulgated with great confidence; and in the controversy which he thought proper to maintain in support of it, he scrupled not to employ ridicule, as well as reasoning. Besides the Roman writers, *de De Rustica*, Virgil in particular, whom he treats with high disdain; he is most equally severe on Dr. Woodward, Bradley, and other writers of his own time.

Tull begins by showing that the roots of plants extended much farther than is commonly believed; and then proceeds to inquire into the nature of their food. After examining several hypotheses, he decides this to be fine particles of earth. The chief, and almost the only use of dung, he thinks, is to divide the earth; to dissolve the "terrestrial matter which affords nutriment to the mouths of vegetable roots;" and this can be done more completely by tillage. It is, therefore, necessary, not only to pulverize the soil by repeated ploughings before it be seeded; but, as it becomes gradually more and more compressed afterwards, recourse must be had to tillage or *horse-hoeing*, while the plants are growing; which also destroys the weeds that would deprive the plants of their nourishment.

The leading feature of Tull's husbandry, is his practice of laying the land into narrow ridges of five or six feet, and upon the middle of these drilling one, two, or three

rows; distant from one another about seven inches when there were three; and ten inches when only two. The distance of the plants on one side from those on the contiguous one, he called an *interval;* the distance between the rows, on the same ridge a *space,* or partition; the former was stirred repeatedly by the horse-hoe, and the latter by the hand hoe.

The extraordinary attention Tull gave to his mode of culture, is perhaps without a parallel. "I formerly, was much at pains, he says," "and at some charge in improving my drills, for planting the rows at very near distances; and had brought them to such perfection, that one horse would draw a drill with eleven shares, making the rows at three inches and a half distant from one another; and, at the same time, sow in them three very different sorts of seeds, which did not mix; and these, too, at different depths. As the barley rows were seven inches asunder, the barley lay four inches deep. A little more than three inches above that, in the same channels, was clover; betwixt every two of these rows, was a row of saint-foin, covered half an inch deep. I had a good crop of barley the first year; the next year, two crops of broad clover, where that was sown; and where hop clover was sown, a mixed crop of that and saintfoin; but I am since, by experience, so fully convinced of the folly of these, or any other mixed crops, and more especially of narrow spaces, that I have demolished these instruments (in their full perfection) as a vain curiosity, the drift and use of them being contrary to the true principles and practice of horse-hoeing."

In the culture of wheat, he began with ridges six feet broad, or eleven on a breadth of sixty-six feet; but on this he afterwards had fourteen ridges. After trying different numbers of rows on a ridge, he at last preferred two, with an intervening space of about ten inches. He allowed only three pecks of seed for an acre. The first hoeing was performed by turning a furrow from the row, as soon as the plant had put forth four or five leaves; so that it was done before, or at the beginning of winter. The next hoeing was in spring, by which the earth was returned to the plants. The subsequent operations depended upon the circumstances and condition of the land, and the state of the weather. The next year's crop of wheat was sown upon the intervals which had been un-

occupied the former year; but this he does not seem to think was a matter of much consequence. "My field," he observes, "whereon is now the thirtieth crop of wheat, has shown that the rows may successfully stand upon any part of the ground. The ridges of this field were, for the twelfth crop, changed from six feet to four feet six inches. In order for this alteration, the ridges were ploughed down, and then the next ridges were laid out the same way as the former, but one foot six inches narrower, and the double rows drilled on their tops; whereby, of consequence, there must be some rows standing on every part of the ground, both on the former partitions, and on every part of the intervals. Notwithstanding this, there was no manner of difference in the goodness of the rows; and the whole field was in every part of it equal, and the best, I believe, that ever grew on it. It is now the thirteenth crop, likely to be good, though the land was not ploughed cross ways."

According to Tull, a rotation of crops, of different species, was altogether unnecessary; and he labours hard to prove, against Dr. Woodward, that the advantages of such a change, under his plan of tillage, were quite chimerical; though he seems to admit the benefit of a change of the seed itself. But the best method of determining the question would have been, to have stated the amount of his crops per acre, and the quality of the grain, instead of resting the superiority of his management on the alleged saving of expense, when compared with the common broadcast husbandry.

On the culture of the turnip, both his principles and his practice are much more correct. The ridges were of the same breadth as for wheat; but only one row was drilled on each. His management, while the crop was growing, differs very little from the present practice. When drilled on the level, it is impossible, he observes, to horse-plough them so well as when they are planted upon ridges. But the seed was deposited, at different depths, the half about four inches deep, and the other half exactly over that, at the depth of half an inch. "Thus planted, let the weather be never so dry, the deepest seed will come up; but if it raineth immediately after planting, the shallow will come up first. We also make it come up at four times, by mixing our seed, half new and half old, the new coming up a day quicker than the old. These four com-

ings up, give it so many chances for escaping the fly; it being often seen, that the seed sown over night will be destroyed by the fly, when that sown the next morning will escape, and *vice versa:* or you may hoe-plough them when the fly is like to devour them; this will bury the greatest part of those enemies; or else you may drill in another row, without new ploughing the land."

Drilling, and horse and hand hoeing, seem to have been in use before the publication of Tull's book. "Hoeing," he says, "may be divided into deep, which is our horse-hoeing; and shallow, which is the English hand-hoeing; and also the shallow horse hoeing used in some places betwixt rows, where the intervals are very narrow, as sixteen or eighteen inches. This is but an imitation of the hand-hoe, or a succedaneum to it, and can neither supply the use of dung nor of fallow, and may be properly called scratch-hoeing." But in his mode of forming ridges, his practice seems to have been original; his implements display much ingenuity; and his claim to the title of father of the present system of horse-hoeing husbandry of Great Britain seems indubitable.

The Cotton Cultivator.

Mr. Editor,—I promised, in my last, to exhibit such advantages as belonged to the Cotton Cultivators, by placing in contrast, before the view of your readers, the old and the new systems of management,—the former with the *hoe alone*, the latter assisted by the *use of the common ploughs* and the *cultivator*.

I have insisted strongly upon the introduction of the common ploughs, into our Sea-island agriculture, not only from a conviction of the great benefits to be derived from them, if made as familiar and habitual an implement as the common hoe; but because they *prepare* the planter for the use of the cultivator, and contribute much towards the development of the advantages of the latter. Indeed I consider that the advantages of the cultivator are greatly diminished, if the planter has not previously expedited his work, by the aid of the common ploughs. If he increase the quantity of land, both of cotton and corn, planted to the hand, the cultivator, it is true, may enable him to keep his fields clean, but how is he to provide the additional time, which this increased quantity of land requires at his hands, to *manure*, *list*, and to *bed* it? Clearly, it must be gained, by some contrivance, which forms no part of the old system of management, in which the hoe alone is used.

It belongs not to my present purpose, else I could show how this is to be accomplished, by the liberal use of the common ploughs. But even were I so disposed, I find the work, in a measure, done ready to

my hands, in an article in your last number, on the "Cotton Culture" of the West; to the useful information contained in which, I refer your readers; claiming only this proposition as one which I suppose every planter will be willing to admit, "That if our brethren in the Upper Districts can plant and manage successfully, 20 acres of cotton and corn to the hand, by the free use of ploughs, we can, by a *similar system*, cultivate 10 acres, after making every due allowance for the difference of soil and culture, and the moisture of our low country climate." More than this it would not be desirable to cultivate, on our sea-island plantations (which are generally limited in extent); except the whole quantity could be *manured*; and this again would not be practicable, without some method less laborious than the present could be devised, for doing that work; or except some radical improvement be made in our present system of preparing our cotton for market, by the introduction of animal or steam power, and labor-saving machinery, by which means the able-bodied force of our plantations might be taken from the gins, and kept steadily employed in collecting and applying manures. By gaining time in this way, and with the aid of ploughs as promised above, we think that 6 acres of cotton and 4 of corn may be manured, and successfully cultivated to the hand. Until, however, other ploughs are invented, or great alterations are made in the form of those commonly in use, so as to adapt them better to our peculiar mode of culture, I think that the above quantity will be found to be the maximum, beyond which no prudent planter, on these sea-islands should venture. As for 20 acres to the hand, I regard it as altogether impracticable, (setting aside the manuring), so long as we pursue the present mode of culture, of throwing our fields into *long narrow beds*; which, however, I think much to be preferred to the *level* or *flat* culture of the Upper Districts; in which form, two-thirds, perhaps, of their crops are cultivated. All the ploughs that I am acquainted with, are calculated for that mode of culture, and accomplish the work very well; but if they are applied to the making of *beds* at all, (without the aid of the hoe) the smallness and deficiency of those beds sufficiently declare the imperfections of the plough, and its unfitness for that sort of work.

Now, to commence with the various processes in the Sea-island practice of tillage; there is no plough that I have seen or heard of, which is capable of turning in the sward, so as to form a substitute, or even apology, for the work of *listing*; which we are now obliged to do altogether with the hoe. Nor is there one which can throw up a *bed* of *proper size* and form, in a state fit to receive the seed, without the use of the hoe after it. The common ploughs, and particularly the "twisted shovel," can give great assistance to the hoes, in this work; but there is not one which can accomplish it unaided, by means of its own adaptation to that object. Now, the *bedded* mode of culture must be abandoned; or more suitable ploughs invented, which will not require the hoe to complete the beds; or, a less quantity to be planted to the hand. Ploughs capable of accomplishing the works both of *listing* and *bedding* might no doubt be constructed, were the ingenuity of planters directed to the subject; by which labor might be diminished, and much time gained. In the next work, that of *hoeing*, an attempt has been made to attain these advantages: which has resulted in the "Cotton Cultivator;" which, with all its defects, still it must be admitted, is capable of rendering the planter much assistance. No implement has as yet been introduced to perform the fourth work, that of *hauling up the beds*, and therefore, the Sea-island planter has no means of gaining any thing, over the old system, in this work.

I now return from the digression into which I have been led, and proceed to explain the advantages of the cultivators; which, it appears to me, can be more intelligibly done, by spreading before you the details of management, pursued by those planters, who use them; and as I am best acquainted with my own, I will state so much of it as may be necessary to explain my views.

1st. then as to quantity. I plant to the hand 4 acres of cotton, well manured; 2 acres of corn, manured as well as I am able; commonly however, not more than two thirds of the quantity: ¼ acre of potatoes, and ¾ of slips, both manured. This I consider the *regular crop:* to which may be added, oats, peas, and ruta baga, in quantities, according to circumstances; which are attended by my field people, and form a part of their regular work, and make a total of about 8 acres to the hand.

2nd. I generally finish planting my cotton, before I even *begin* to prepare my corn land: although I prefer to list my corn land as early in the season as possible, and do so, whenever my other work will allow. I use ploughs freely, both in my cotton and corn land, as a *preparation for bedding;* considering, that not only time and labor are saved by them, but that the soil is much better prepared for the seeds and tender plants, than when bedded by the hoe alone. I am compelled, however, to *complete* all my beds with the hoe; owing to that want of adaptation of the ploughs now in use to our peculiar mode of tillage, to which I have before adverted. I find that two tasks to the hand are not only more easily finished, but that the work is better done by the hoe, after the plough, than 1¼ task without the previous aid of the plough. Note here, Mr. Editor, that in using the term "task," as a measure of land, I adopt the phraseology of the low country agriculture, where it is understood to mean *the fourth of an acre.*

We will suppose now that the cotton has been planted; and that in listing (in which work I have as yet found no implement to save labor and gain time) in bedding and in planting the corn crop, two weeks have been consumed. During that time myriads of grass seeds will have vegetated, and covered the alleys, and sides of the beds. This is the time for the cultivator to begin, as it will do the work, of destroying those rising pests, much more effectually than the hoe commonly does. I work one cultivator for every eight hands. Each cultivator, conducted by a small boy (who would work as less than a half hand) hoes 5 acres a day, which is equal to a journey of about 16¼ miles, when there are 21 beds to the task. I state this, to show the labour which the boy undergoes; which it must be observed, is much diminished, by the rest afforded to his arms, by the plough handles. The cultivator hoes the whole of the *alley* and both *sides* of the bed, to within 6 inches of the cotton plants; going down first, on one side of the bed, and returning on the other. To hoe this narrow slip, as well as to stir the earth between the hills (for I sow my cotton at certain distances, by means of a dibble, with two wooden teeth) is all the work which is left for the hoe. I require this part of the bed to be carefully and thoroughly hoed by the hands, at the rate of 5 tasks each. The sides of the beds, and the alleys, which have been swept over by the cultivator, are not touched by the hoes, except occasionally to chop some weed, which may have escaped the cultivator, and is required to be removed as unsightly. Should any of the small tender grass, (such as I have before alluded to) have been skipped over by the cultivator, the hoes also pass it, as it can do no injury, situated so far from the cotton; and it is not likely to escape the cultivator, at the next working,

which, it is calculated, will pass over that spot again, within 6 or 7 days. The cultivators, calculating one to every eight hands, will go over the field once in 6 2-5 days, at the rate of 5 acres a day: whereas the hands who follow them, will hoe the field through in 3 1-5 days, at the rate of 5 tasks a day. It therefore becomes necessary, to start the cultivators at least *four days* before you are ready to begin with the hoes; else the latter will overtake the former. At the above rates of day's work, one cultivator to four hands, would always keep the same distance ahead; which would be desirable, since the soil could then be stirred once every 4 days, first with the cultivator, and next with the hoe.

As soon as I have finished my *first working*, as above, the cultivators are again started, at that part of the field where they first began; with a view to hoe it over, a second time, preparatory to *hauling*. This proves, commonly, a much more effectual destruction of the grass, than the first working; for in passing over the surface the first time, the cultivator has cut away the little protuberances, and filled up the inequalities in the alleys and sides of the bed, and thus *fitted itself* to every part; and accordingly, it now shaves the whole surface with an even and steady sweep. After allowing the cultivators to get ahead of the hands, about 4 days, either by diminishing that force at the first *hoeing*, or employing them about other work after it is over, I then commence my first hauling, which is done in the usual manner, at the rate always of 2½ tasks, and sometimes 3 to the hand; for it must be remarked, that the cultivator so thoroughly pulverizes the alley, to a certain depth, that the labour of hauling is greatly diminished. And here we may be allowed to remark, that some implement for the *hauling up of the beds*, is a great desideratum still unsupplied: one, however, which we have reason to believe it is in contemplation to construct, by which it is expected, that the same assistance will be rendered to the hoes in that work, which is now afforded them by the cultivator, in the operation of hoeing. Having no implement to accomplish this object, I gain no time in my *haulings*, and the hands doing but half the quantity, which they did in the *hoeing*, or first working; the cultivators keep always the same distance ahead, at which they started, and the same land is taken up by the *haulers*, which 4 days before the cultivators had hoed.

Having given my cotton two workings with the cultivator, and as many with the hoe, which occupies me a little more than two weeks (the 3 days gained being filled up with other work) I then turn to my corn, which, about that time begins to claim my attention. It will be remembered that the cultivators have finished the second hoeing of the cotton, 4 days before the hands have finished hauling. They are, accordingly, now ready for hoeing the corn; which is done in the same manner as the cotton; with this difference only, that they are made to run somewhat deeper below the surface; in order the better to loosen and pulverize the alleys and beds, and enable the roots to expand in search of food. The hands follow in due time, and instead of *hoeing* the corn in the usual way, and throwing up a *little earth to the hills*, I require them, to hoe only the narrow slip left by the cultivators, upon the top of the beds, and then, (if the corn be large enough) to give the beds a thorough *hauling;* which I have found to be much the most effectual way of destroying the grass. By this means, I save the labor of one entire hoeing, and leave my corn growing in a much larger, and better bed, than if it had been hoed, and merely killed in the usual way. The beds too, are in this state, in a much better con-

dition, to receive the peas seed, whenever I may be disposed to sow them throughout the corn-field. This working commonly occupies me about 4 days, at the end of which time my cotton may require the 3d working; which, it depends on circumstances, whether I make a *hoeing* or *hauling*. In either case, however, the cultivators precede the hoes; and the same process is gone through, as in the 1st or 2d working. After the *third* working, I seldom have occasion to use the plough in my cotton, with a view to destroy grass. I sometimes use it, to force the growth of the plants in such parts of the field, where I find them tardy in coming forward; which in moist, cold soils, I think I have found it useful in effecting.

After giving the cotton *three* hoeings, the cultivator passes again through the corn-field, with a view to stir the soil, and destroy any grass which may have sprung up; after which, the hoes follow, and either repeat the *hauling*, or give the tops of the beds a light hoeing.

In working my slips, I *hoe* altogether with the cultivator, and haul with the hoe—thus saving the labor of the first work with the hoe. Such is the work which the cultivators perform when they are properly made, and stocked well; and when also the field is in a condition fit for them to work in it. And here let me note a few memoranda, as hints to those, who may be disposed to use them.

Note 1st. If the point of the cultivator will *not take the earth inthe bottom of the alley, and the lower parts of the bed* (which is a very common defect) it is an evidence that the blacksmith has not bent the point downwards sufficiently. This defect can be remedied on the plantation, with little risk of breaking the cultivator, by simply heating that part well in a strong fire, and giving it, whilst heated, a few smart strokes with a hammer.

Note 2d. If the *alleys* be *flat* and *wide*, or *ridged*, owing to *imperfect* bedding (which is not uncommon in the corn-fields, where the soil is usually more stiff and heavy than in the cotton, and where also, less care is taken to do that work), in such case, "the cultivator is not fitted," as I remarked on a former occasion, and consequently it will not work. This defect is remedied by *deepening the bottom of the alley*, by means of a shovel plough (which throws the earth equally on both sides) being run of a moderate depth, through the centre of the alley. A boy and mule will do from 8 to 10 acres a day in this work. If it be a very heavy soil, or a stiff clay, as sometimes happens in corn lands, and it be required to turn up the alley very deep, then a pair of oxen must be used, fitted to a yoke about ten feet long; so as to enable one ox to walk in the first alley, and the other ox in the third alley, whilst the ploughman with the plough occupies the second alley between the two.

Note 3d. That the cultivator should be started *early*, whilst the grass, although numerous, is young and easily killed. It is the small, fine grass, upon which, although it is an infant to-day, will be a giant in a fortnight, the cultivator acts so fatally. If, then, it has been delayed so long, that the grass has had time to send abroad its roots, and mat the surface, the cultivator may indeed bruise and check the grass a little, but it cannot destroy it. As a corollary then, it may be stated, that the cultivator will be found of little use in lands which are much infested with "*joint*," or "*nut grass*."

Note 4th. That little benefit should be expected from the cultivator in stiff soils, which have much tendency to remain in hard lumps, and that when used in such situations, it should be after a rain, when the lumps have been softened by moisture.

Having thus placed before you the system of management pursued by those who prepare their land with the common ploughs, and use the cotton cultivator afterwards; it remains now, only for me to exhibit it, in contrast with the old system, where the hoe alone is used. To make this contrast the more plain, we will suppose that the two individuals who pursue the different systems set out under the same circumstances—that they plant for the same number of hands, and the same quantity to the hand. We will suppose that Mr. A., who pursues the former system, has prepared his fields in such manner, that they are fit for the cultivator to work in every part; and like his neighbour, Mr. B., he is ready to begin his first hoeing on the 1st day of May. Now Mr. A. having anticipated that work, has sent ahead his cultivators four or five days, and when he comes to his field with his hands, he finds the alleys and sides of the beds ready hoed to his hands; his people do him five tasks apiece, and in 3 1-5th days, he has finished his first hoeing, and is ready for his hauling; or has leisure to undertake other work. Mr. B., in the mean time, has put his people to work; the *tops* of the beds and the spaces between the cotton are not only to be hoed, but the *alleys* are to be scraped, to give him loose earth, when he comes to his hauling; the *sides* of the beds are to be hoed, to keep down the young grass, which is starting up there; and having bedded his land entirely with the *hoe*, his beds throughout all his stiff lands are only a heap of hard *lumps*, each of which requires to be broken with the hoe. His people do him 2½ tasks in the sandy lands; 2 tasks when the soil is more tenacious, and requires the lumps to be pulverized, and he is from 6 2-5 to 7½ days in getting over his field.

Here is an advantage which Mr. A. has gained at once, by the use of the cultivator, of more than *three days work* with his whole force. He gains the same time also, at his 2d hoeing of cotton. In the workings of his corn, he will derive an advantage again, of at least 2 days more; and in hoing his slips, another day: making the gain in *time* equal to about 9 days' work, of all hands. If a deduction of 2 days be made from this, for the work of the plough-boys (which will more than cover it) there still remains a gain of about 7 days work, with his whole force acquired during the *hoeing* season, which is less than three months.

But one of the greatest advantages of the cultivator, is the rapidity with which the planter is enabled to get over his work; and the power which it thus confers upon him, of spreading his force over the whole field at once, and striking the grass in every part. In the slow and tedious process of the *hoe*-culture, it takes a planter from 7 to 8 days (Sunday intervening) to get over his fields; and if the weather be unfavorable, or the grass may have got ahead of him, it frequently takes much longer: whereas with the cultivator, he requires only a little over 3 days. If, again, the season be moist and stimulating, pushing the grass vigorously; and the planter has lost work by bad weather, or other unexpected occurrence; or if other parts of his crop may have required his attention, and drawn him off from his cotton, previously to *hauling*; or if after his hoing, he has had some heavy rains upon his fields, which have settled the earth in the alleys, in a compact mass; in either of these cases, (whether the necessity arises from getting rid of grass, or from stirring and drying the soil), it frequently happens, that the planter is obliged to *hoe again*, previous to hauling. Now, in either case, the cultivator sent ahead a day or two, will save him this hoeing; the gain of which time, at such a crisis, is generally very important, and sometimes may save a crop from receiving material injury.

Such are the chief benefits in the gain of *time* and saving of *labour*, which the cultivator affords. After an experience of several years, I can with candour say, that I can manage now, with more ease, 4 acres of cotton and 2 of corn to the hand, than I could formerly 3½ of cotton and 1½ of corn; and besides have more time on my hands to undertake other work. But I make them a *part of my system*, and in the arrangement of my business, the aid which I expect from them, forms one of the elements of my calculation. I therefore provide them beforehand, in the same way as I provide hoes, axes, and spades for my plantation. I keep them in good order, have one or two spare ones, in case of accident, or in case I wish to multiply them, in order to sweep more rapidly over my crop, on any sudden emergency; and lastly, I have them of different sizes, so as to suit the different distances of the beds apart: for, it may be proper for me here to remark, that it requires a cultivator of different *length of wing*, to skim a bed, when there are 21 beds to the task, from that which is required when there are 24 to the same quantity of land; and I may further add, that when a cultivator is ordered to be made, the distance of the beds apart, should always be stated to the blacksmith, in order that he may regulate the length of wing accordingly.

Any planter, however, who is not disposed to introduce the cultivator as a part of his *system* of management, and who is not determined to make every thing to suit it, should by all means be dissuaded from using them, as the benefits will be few and precarious, and disappointment certain. The great majority I am persuaded will need no dissuasive of this sort. Any thing which breaks in upon the smoothness of long established routine, will be resisted by many, as an intruder which disturbs their domestic tranquility. Whilst there are not a few again, whose skill as planters is so perfect, and whose judgment is so penetrating that they can always make "as much cotton as they can pick," and as much corn, as to feed every thing liberally; at the same time planting only 3½ acres of cotton and 1½ of corn to the hand, and attending both with the hoe alone. Individuals possessing such extraordinary talents will of course need no extraneous aid, and would act absurdly to borrow it.

But there are others again, who (either possessing less exalted abilities, or estimating more justly those which they do posses) are willing to admit that they never make "more cotton than they can pick;" and who, should an event so rare occur in their practice, have resigned themselves to the calamity of leaving the balance in the field, not as the waving trophies of their superior management, but as an evidence that Heaven has smiled upon their imperfect efforts, with more than usual benignity. Sensible of their need of aid, they are ready, with modest thankfulness, to receive it from every source; and if they fail in their object, they have at least the satisfaction to reflect, that they have not left untried any means, which may have held out to them a reasonable promise of adding to the comforts of their families and dependents; of improving their property, and increasing the stores of wealth and subsistence; and thus, indirectly, of promoting the good of society. I am, very respectfully,

ST. JOHN'S COLLETON.

PART II.

SELECTIONS.

The Rot in Cotton.

[FROM THE SOUTHERN RECORDER.]

Last year I planted two crops of cotton, one near Watkinsville, and the other on the Oconee, near Athens, the two places being five or six miles apart; the crop at Watkinsville rotted so little, that it may be said to have had no rot, while the crop on the Oconee rotted worse than any cotton I saw last year, or any other year. Being a country doctor, it was during the year an every-day occurrence to have at my house planters, who came to obtain medical advice; I made it my business to select the most experienced and successful of them, (many owners and overseers of plantations,) and carry them to see my crop, relate the difference, and request their opinion of the cause: great many reasons were given; a few only will be noticed, which appear the most probable; after which I will add my reasons for believing all of them wrong. One experienced planter, who began poor, and made a fortune by his skill in raising cotton, and whose opinion was entitled to great confidence, assured me, the cause, to him was very plain: "free post oak land," said he, "is the land for cotton, while strong red river land will rot." He advised me to plant all my cotton on the post oak land, and raise my provisions on the river—this had long been his opinion, and now he was certain of it. Another planter appeared pleased with this positive proof of the opinion he had entertained; "here," said he, "your land is all first and second year ground, while on the river it is old land; new land, if it escapes the rust, will be certain to make a good crop, as it will not rot." He was still more certain from the fact, in the second year ground he found a little rot, but in the new ground he could find none; next year he was determined to plant all his new ground in cotton.

Another planter conceived he could give me the undoubted reason of this great difference: he had long since known that shallow ploughing was best for cotton; the river plantation was all listed deep with two-horse ploughs, while here it was only scratched. This was, in his opinion, sufficient cause to explain the difference.

A real practical planter advised me, with this proof certain of the ill consequences of horizontal ploughing, to lay it aside; "see," said he, "on the river plantation, all the ground is ploughed horizontal, which, by retaining moisture, has rotted all the cotton, while the other crop, by being ploughed straight, lets off the rain, and the cotton does not rot."

Another planter inquired when the two crops were planted; when told, on the river I began 1st of April, at home 15th of April, he felt fully satisfied this was the whole cause. He insisted it would be best if no cotton was planted until May; he had lost several crops, until he found out that late cotton was least subject to rot.

Another opinion was, that on the river, cotton had been planted, more or less, for years, while here, as no cotton had been planted, the insect which produced the rot had not, and the crop therefore escaped.

An excellent planter took great interest, and examined both crops; he was more satisfied than ever of his opinion; cotton should always be planted in wide rows; on the river the cotton was three feet apart, in Watkinsville, four feet: wide cotton, he thought, the air and sun acted upon, and prevented rot.

I know not how many different theories were advanced by planters whose experience and success entitled their opinions to value; the above are some of the theories advanced by persons entitled to the most confidence, and each one of them advocated by the most numerous supporters. Now, in searching into the cause or causes of an evil of a doubtful character, some light may be thrown upon it by ascertaining what was not the cause or causes. Each and every one of the above theories are the suggestions of experienced and successful planters; every one appeared fully satisfied he had given the true cause of rot, while a more general collection of facts would prove every theory advanced to be contradicted with facts, and entirely wrong; and although I will attempt to show the fallacy of these theories by only a few facts, yet, in every instance, many more facts of a similar kind could be brought forward.

The opinion of the thin post oak land here being more suited to cotton than the strong red land on the river, is incorrect, for Mrs. Nunnally's plantation, of the same quality, and not two miles from me, rotted very bad indeed, while mine rotted none. Mr. Davis made the best cotton I saw last year; he had no rot. His plantation is on the river, his land is stronger and redder than mine, which rotted so bad. It cannot be altogether therefore, the quality of the land which causes the rot.

The opinion of the new land not rotting, must be an error, for on both of my places I had some new, and some old land in cotton; on the river the newest land was decidedly the most rotted.

Of the effect of deep ploughing I was somewhat uncertain; it appeared to be supported by so many facts by the experience of the person who gave the opinion, I therefore took some trouble to examine many crops; many facts, however, prove it incorrect. On my own place, one fact proved it to be wholly incorrect. In some of my fields the rows were listed every six feet with large two-horse ploughs, the intermediate rows ploughed shallow, no difference was observed in the rows; again, the field I ploughed deepest was least rotted.

I could have placed some confidence in the opinion, that horizontal ploughing caused rot, as my cotton was the only cotton I knew that was ploughed horizontal, and it rotted worse than any cotton I saw; but the field I ploughed deepest, and took the most pains to have exactly horizontal, was rotted least, and in places none at all.

Two facts fully contradicted the opinion, that the early and late planting caused the greater or less quantity of rot: Mrs. Nunnally's crop, which rotted so bad, was planted later than mine, which rotted

so little, while Mrs. Davis's beautiful cotton, that rotted none, was planted in March, from one to two weeks earlier than mine, which rotted so bad.

Of the effects which frequent planting would have in breeding insects to cause rot, more will be said, but the fact is contradicted by the experience of every practical planter.

Whether planting thick or thin really has any effect in causing the rot, much observation has left in doubt on my mind. All other years that I have noticed, I believe the thinnest cotton rotted least, while this year was an exception; the rankest and thickest cotton I had, rotted least. I examined many crops, and constantly found very rank, thick cotton least rotted. Last year appears to have been different from former years; but although I am confident cotton does not rot from being too thick, still it may be an exciting cause, and help to increase the evil.

These, I say, and many more, were the theories of the most noted cotton planters. Facts contradicted them all, and showed conclusively that every one was wrong; still, the observation of age and experience should receive attention. Although not one suggested the constant and specific cause of rot, yet, no doubt, most or all of them were correct to a certain extent: experience had proven, that when the predisposition to rot existed, all these might be exciting causes to increase it, while they might prove harmless when the predisposition was less; and so, indeed, it would appear that they were all intended —for when the inquiry would be made why this or that cause increased or diminished the rot, it would always prove that they had in view the effect that they would have in increasing or diminishing the insects which almost all planters appear to believe the great and constant cause of this great evil. The constant and popular opinion of the day appears then to be, that an unknown insect injures the cotton bole, and causes rot; but the numbers of these insects may be increased or diminished by circumstances. When the predisposing cause is entirely unknown, and no idea can be formed of the extent to which it may prevail, experience goes very slow in finding out exciting causes; for where, in one instance, we have noticed an exciting cause that has done great injury because the predisposition was strong, in the next instance that same exciting cause is harmless, because the predisposition is weak. Thus it is with cotton; the predisposing cause of rot is unknown, or conjecture; experience has discovered many exciting causes, but little or no profitable use has been made of them. In consequence of the unknown extent to which the predisposition may prevail, the rot has, for many years, done great injury to the cotton planters, and we know now little more how to diminish it than when it began. The opinion that rot is caused by insects, is, I believe, wholly an error, and it is the most unfortunate opinion that could have been formed. To believe that insects produces rot, at once makes the evil remediless, and we must quietly consent to an evil so great, because there is no prospect of getting clear of it. Had this unhappy conjecture never have been formed, and had the rot have been thought to be a disease, and the facts that experience could collect have been arranged, we would long since have got rid, if not altogether, in part, of this evil. The opinion that insects cause rot, appears to be so general, that I will relate some facts and experiments to contradict it.

I remained a long time perfectly still in my cotton field; I could see very small flies light and remain on the cotton boles; the smallest

motion and they were gone. I could net see what they were doing, nor could I catch one of them. I took a number of boles, and examined them with a very powerful microscope. I could see on the bole a great many small white eggs, so small that I could not see them with the naked eye, or common magnifying glass. I held them to my mouth, and let the warm breath come upon them—I could see nothing of them; but upon examining with the microscope I could see many little white worms with yellow heads; they quickly passed into the bole, and apparently with so much ease, that they must have passed into the pores of the bole. This appeared to confirm the opinion, that insects caused rot. It would appear probable, that the fly perforated the bole, and caused the bruised looking spot, lodged its eggs, these hatched into little worms, and they went into the substance of the bole and continued to injure it. Many of these boles were marked; some rotted, and some did not. I saw the eggs on sound, as well as rotted boles; I could not see that they did any injury, nor could I discover, by the most careful examination, what became of the little worms after they went into the bole. I also found as many of these worms and eggs on the crop of cotton that rotted none, as the crop that nearly all rotted.

To know certainly whether insects did produce the rot, I have tried a great number of experiments, which, to me, were convincing. The smell of camphor is deadly to most insects; a butterfly, for instance, passed over a lump of camphor, dies immediately. I have, from time to time, put lumps of camphor around cotton stalks; I have dipped the cotton boles in a strong tincture of camphor, as well as a strong infusion of it in hot water, but no effect in preventing rot was produced. I have painted the boles over with several coats of paint, dipped them in oil, and then given them a covering of copal varnish, but they rotted as before. I have dipped them in every thing I could think of that insects would probably abhor, such as arsenic, corrosive sublimate, &c.; I have put on them mercurial ointment; I have spread adhesive plaster on cloth so that no insect could pass through it, then made little bags, and tied them round the boles, all of which had no effect in preventing rot. In some instances where boles did not rot that were experimented on, other boles treated in the same way would all rot. From a great variety of experiments tried and repeated on boles of different sizes, and under every different circumstance, I am confident I neither caused or prevented the rot. Repeated experiments prove that the rot cannot be caused by insects; reason proves it also. We may walk into a cotton field, and find one stalk of cotton with nearly every bole rotted, while the stalk next to it shall not have a rotted bole, although the boles of these two stalks shall be interlocked; or perhaps one row of cotton rotted very much, while the adjoining row shall be rotted none. I saw Mr. Connerly pull up twelve adjoining stalks, and on the twelve there was not a sound bole. I then noticed three stalks, every bole of which was sound, the next stalks were rotted very bad. Who can believe insects would be thus choice, which boles to destroy, and which to let alone? and this is a constant occurrence in the worst rotted fields. We may, every now and then, find stalks with not a rotted bole, and where there is very little rot, we may find stalks with not a sound bole. Some places, in a field or plantation, is often rotted very much, while others have very little, or none. These facts, and many more that might be named, must prove that we must look for some other cause for rot, than insects. But to make

certainty more certain, it next required to try if the rot could be produced by injuries done to the boles. To determine this, I have taken a number of stalks as they came, and passed needles, pins, &c., into them and through them. A great many of these trials have not cleared up some doubtful points. Some stalks of cotton we find more disposed to rot than others; on such stalks, I am disposed to think violence done to the boles will make them rot, for on such stalks I found so many of the boles that I had perforated, or otherwise injured, rotted, that a doubt was left whether these injuries had not caused them to rot; but as many other boles on these stalks which were not injured were also rotted, and a few which were injured not rotted, this point remains doubtful. But on stalks that are healthy, on which there are no rotted boles, I am positive no injuries of this kind will produce rot. I have passed needles through them and left threads passing clear through them, perforated them with needles and pins, and bruised them in various ways; numerous trials convinces me, that external injuries have no effect in producing rot, if the stalk is sound and healthy. Mr. Davis, who had no rot in his cotton last year, tried these experiments with similar results. Whoever will try experiments will, I think, satisfy himself that insects do not cause cotton to rot. The best hope of getting rid of so great an evil, is to search out the true cause or causes, and by avoiding them, prevent or diminish its violence. It is, I believe, as much a disease of the plant, as the yellow fever is of the human family; it has its proximate, its predisposing, and its exciting causes. We must ascertain all the causes we can, and if we cannot prevent them all, cure the disease by preventing some of them, we may diminish the effect of others, and in part, cure it.

The proximate cause of the rot, is not very material: it is altogether the effect of other causes; by preventing them, we will prevent the proximate cause also. But it must depend upon a want of proportion between action and power—Hunter would say from an increase of action, and diminution of power. It is a gangrene or mortification of the bole. During the long wet spells, when the plant is in a rapid growth, or in dry weather after a shower, when the plant takes a quick growth, we have most rot, for then the action is too great for the power. Let us notice the similarity between a mortification and the rot, and we will find the resemblance so great, that if Hunter's system of mortification, all of which I believe, is correct, this is the real or proximate cause of rot. When a limb mortifies, if it is amputated, the mortification will attack the stump; so if a cotton bole is rotting, if we cut out all the rotted part, the bole will rot in another place. But when the mortification stops, then the limb may be amputated with safety; so it is with the rot. We frequently find the bole rot to some extent, and stop rotting; then cut out all the rotted part, and it will still open and make some cotton. No matter how rapid mortification may be progressing, so soon as the limb is amputated, mortification ceases in the amputated part; so with the rot—cut a rotting bole so as to take off all that is rotting, and it ceases to rot so soon as it is removed from the rest of the bole. A mortification ceases so soon as the person dies. No matter how rapid, or how many boles may be rotting, pluck off one bole, and the rot ceases in that bole; or pull up, or cut off the stalk, and the rot ceases in all the boles on it. The rot is a complete gangrene or mortification of the cotton boles.

When a cotton bole begins to rot, it shows a spot which looks bruised or watery; sometimes it progresses with a dry rot; at other times, much foam and water runs from the part. We would be induced to suppose, from a slight examination, that the injury was external; but cut into many boles, and examine carefully, and we will always find the disease begins in the bole, and passes out; cut open many apparently sound boles, and we will often find the disease passing out, although it has not shown itself on the outside. The cure of the rot is *certain*—cut off the bole, cut off, or pull up the stalk, and the rot ceases immediately; but as the remedy is little better than the disease, we must look for the predisposing and exciting causes, and by preventing them, put a stop to the operation of the proximate cause.

Of the predisposing cause. The proximate cause, observe, only exists with the disease, or is the disease itself; it occurs when there is a predisposition acted upon by exciting causes; all exciting causes would be harmless, were there not an already formed predisposition; there must be a predisposing cause, acted upon by one or more exciting causes, to produce the proximate cause, or the disease: the predisposing cause is, therefore, the root of the whole. Well! what is it that has continued so long to do much injury to cotton planters, and as yet eludes research, and defies all remedies?—We must find it out before any good can be done. *It is, I believe, a diseased or morbid condition of the seed*, produced from the cotton, as well as the seed being thrown together in large quantities, the bulk being so large that the seed becomes heated or diseased, not so much as to prevent vegetation, but to produce an unhealthy plant. Every experienced cotton planter who will reflect on this subject, can bring up many facts to prove this to be the correct theory, nevertheless some facts will be given, that have come under my own observation. A number of years ago, a gentleman passed by Mrs. Nunnally's plantation, and stopped for a drink of water; he said, in some distant country, (I do not know where) that he had seen a field of such beautiful cotton that he got down and picked a lock of it; he gave it to them; it had six seeds in it; they were carefully saved and planted from year to year, and it was wholly without rot; it was beautiful cotton, and so much resembled the Petit Gulf cotton that I must think it was the same cotton. I got a load of it, and planted it; the first year it rotted none; next year much worse than my other cotton. For this reason, the first year as it did not rot, I made a large quantity; it was thrown in a heap by itself, ginned up, and the seed thrown in a large bulk by themselves; they heated, and when planted, the seed produced rot, worse than any cotton I had. Mrs. Nunnally continued to plant them without any rot. She had a large scaffold, and carefully sunned the cotton as well as the seed; but year before last they planted the whole crop of them: the bulk of cotton and seed was so large, that usual care could not be taken of them, and they produced the worst rotted cotton in the neighbourhood.

Some years ago I went to Mr. John Puryear's plantation: his cotton was rotting very bad, all but about an acre of Mexican cotton—this had no rot. This was the first Mexican cotton planted in this country: I got some of the seed and planted them; this cotton had no rot; we planted this cotton, and it still had no rot; I thought I had got clear of the pest of rot; but when we began to plant it largely, and throw the seed in large bulks, it rotted as bad as other cotton, and was abandoned. I believe that it is possible, with high culture and manure to produce,

if we had no rot, five thousand pounds of seed cotton to the acre. An acre, in hills three feet square, would have near five thousand hills, one stalk to the hill; a stalk of cotton, on land as rich as it can be made, will make one huudred boles, or one pound, which would be nearly five thousand pounds to the acre. To try this, I had one stalk of cotton highly manured and thinned to this distance; it grew very large; I directed a careful woman every Saturday to pick all the open cotton on it, and keep it in a bag; but before it was half done opening, it accidentally got destroyed, and was forgotten. Next year, while planting, the woman reminded me, that what cotton she had saved was still in a bag in the house; it was sent for, and as I could not gin it, cotton, seed and all was planted. Very few seed came up, but the few stalks it made had no rot, while the whole field rotted very much. I can conceive of no other cause but its being in small quantity. A gentleman of my acquaintance, on his way from Augusta, as he passed a field of cotton, picked a bole or so, picked out the seed, and gave them to his friend by the way of a quiz, saying it was a very valuable kind of seed he had obtained in Augusta; he carefully saved them, and for some years prized them very much, as they had no rot; but when he began to save these seed in quantity, they rotted as his other cotton. With these facts in view, let us now see if a statement of circumstances, as they occurred, will not fully explain why one of my crops rotted so very bad, the other little or none. A friend of mine, who plants very largely, a few years ago ginned out his cotton, and threw the seed together in so large a bulk, that at planting, his seed were found all black from overheating, and unfit for planting. He got from me seed to plant his crop. Last year, he moved his hands to another place, and therefore ginned out his cotton as soon as he could. Hearing I was in want of seed, he told me I could have from his place as many as I wanted. I got my seed, therefore, from the large bulk that perhaps seventy bales of cotton produced: they were put in a room, and then planted. They came up well, but no sooner was it up, than it began to die, and I thought none would be left; for seed that has been heated will come up, but it is no sooner up than it dies. This is the cotton that I say rotted more than I have ever seen cotton rot, and I believe the cause to have been the heated state of the seed. To confirm this, two other facts may be stated. On the same place, I planted some Petit Gulf seed; they rotted very little. Again—the year before, I planted one small field in cotton; it rotted so much, that little attention was given to it. I never had it picked till after the frost, when all the cotton was open; this was ginned, and the seed thrown in the back part of the room, the other seed being on it. The last field of cotton was therefore mostly planted from this seed, and it turned out as might be expected; in places it was rotted as bad as any, while in other places it had little or no rot, as the seed happened to be mixed. Of my other crop, which rotted none, I procured these seed from my brother; he is always very particular to sun his cotton well. The seed were brought home directly after ginning; they were put in a carriage house, the doors of which, when open, laid open the whole end of the house, the house being so situated, that the sun came fully into it when the doors were open. As this house was a great place for my children to play in, the seed were exposed to the sun every day, and frequently moved about by them. This cotton had no rot: how else shall we explain it but by the fact that they were never in a large bulk, and had the sun on them every day?

Many singular facts in the growth of cotton, if these opinions be correct, may be satisfactorily explained. Why are large cotton planters more subject to loss by rot than those who plant in the small way? Because the small planters do not have the seed heated by large bulks. Why in all fields do we find some stalks very much rotted, while others are rotted little or none? Because those seed which were in the interior of the heap were heated, while those over the surface were not; some cotton was picked wet, some dry, &c. Why is any kind of new and scarce cotton for a while clear of rot? Because the seed are not heated by being in large bulks. The Petit Gulf cotton, from this cause is less subject as yet to rot, but will, after a little while, rot as bad as other cotton. Of the exciting causes we have many. Every planter can furnish exciting cause of rot. I shall only mention two—wet weather, and working cotton when the ground is wet. Now, althongh we cannot control the seasons, yet by preventing the predisposition, the exciting cause would do little injury, or be harmless.

We have made considerable progress towards the removal of an evil, when we have come to a knowledge of its true cause or causes. If these suggestions as to the causes of the rot in cotton be correct, they will lead on to such plans as may diminish or prevent it.

Of the proximate cause, or the disease after it has occurred. We have a remedy, as far as it goes, certain in its effect: cutting off the stalks, or pulling them up, puts an immediate stop to the rot. I have more than once, when the rot was very bad, had the rankest spots pulled up and laid in heaps along the rows; the rot would then stop, and when all the boles were open, a saving crop might still be picked out. But there is an intermediate stage, when all the exciting and predisposing causes have already had their full effect, and when nothing can be effected by way of prevention, and the rot is already raging with violence; when there is not a sufficient number of boles arrived to maturity to make pulling up the stalks profitable, if it were practicable; while at the same time the boles are observed to rot as soon as they approach maturity. In this stage we are not altogether without remedy. In 1821 I had a small field of fresh land, with which I had taken great pains; it was beautiful cotton; the rot made a start in it, and progressed with great violence; it did look like it would all rot; it was the wet rot, and the foam ran from the boles in quantity. Now it was certain that pulling up the stalks would stop the rot, yet as the boles were mostly not grown, it would also ruin my cotton. I wanted a remedy which would check the action, without destroying the vitality of the stalk—a remedy which would approximate towards killing, without absolutely killing the stalk. A cornstalk sends out a circle of crown or horizontal roots, for every ear or shoot it bears; cut off these crown roots as they appear, and although the stalk will continue to grow, yet it will produce little or no corn—from which it would appear that the more perpendicular roots supplied the stalk, while the more horizontal roots supplied the ear with nourishment. Why might not cotton be the same? The deep top root mainly nourishes the stalk, while the great number of horizontal roots, which come out as the stalk begins to bole, are mainly useful to support the boles. If this reasoning were correct, whatever would destroy or break off these roots, would diminish the action, and might check the advances of rot. Hogs are very fond of rooting about the stalks of cotton, and eating these roots; with this view a large stock of hogs was turned into my field. I hardly think one stalk escaped them;

they rooted round, and destroyed all these horizontal roots; the stalk only, as it were, being kept up by the main tap-root. The effect was astonishing; the rot soon stopped, and I made on this small field, the best crop I have ever made, before or since. I could mention a number of facts in proof of this. I state it as a fact, that hogs in sufficient numbers will stop or check the rot. I have heard it suggested, and I am disposed to believe, if a small plough was run deep, very close to the cotton, both ways, so as to break the roots all around, it would check the rot.

It would require a total absence of all exciting causes of rot, to be safe, while a predisposition existed; a hope of success will, therefore, mainly depend upon diminishing or removing the predisposing cause. Many persons believe, that the rot very much depends upon the condition of the seed, and many attempts have been made to prevent it, by giving their attention to the seed. Most of these attempts, according to my views, have been exactly such as I would have tried if I wished to increase the quantity of rot. When wheat has been cut, and remained a considerable time in the field, then perhaps, hauled home, stacked, and remained a considerable time in stacks before it is thrashed out, then cleaned and well dried in the sun, with all this precaution, if it is then put together in a stout bulk, it will heat or go through a sweat, and spoil. If Indian corn be gathered too early, although to all appearance it may be dry and cured, yet, put it in a large bulk, and it will heat and spoil. What should we expect of cotton? A prevailing opinion is, that the early open, first picking, will make best seed; this cotton is picked, while wet with dew, often in damp weather, and thrown together in quantity early in the season, when the weather is warm. Nothing would appear more certain, than that these seed would heat and be injured. To prevent this, scaffolds are made and the cotton sunned, perhaps a day or less. This is doing less than nothing—it is this much useless trouble. The seed of cotton, surrounded first by a hard covering, then by the fine lint attached to the seed, then by the cotton, if scattered thin and sunned every day for a mouth, they would not be cured sufficiently not to heat when thrown in a large bulk in warm weather. But we are generally in so much hurry to get our cotton to market, that the cotton is ginned up, and this early seed thrown in heaps and saved for seed; in this state they are much more liable to heat, than if left to heat without ginning. A bulk of five hundred or a thousand bushels of cotton seed, makes so close a heap, that it is air, water, and sun proof. It must and will go through a *sweat and heat.* We could not take a better plan to cause the seed to heat, than to take our first picking, sun it a day or so, and then gin it, putting the seed in bulk while the weather is yet warm. Seed thus managed, will often heat so much, that they will not vegetate at all; but if not so far heated as to be killed, they will produce diseased plants, disposed to rot; so that I say the attempt to improve the seed by saving the most early seed, is exactly calculated to produce rot—not only so, but the cotton that opens later, when care is taken to pick it only in dry weather, and have it sunned for several days, when put in large heaps will still go through a sweat and heat, to the injury of the seed. Any person who will think for himself on this matter, and take the trouble to examine the temperature of large heaps of cotton, as well as seed, with his senses to judge of its heat and moisture, also with a thermometer, will become satisfied that it is impossible, in the large way, to save early picked cotton seed, without

their being injured by heating. If the heating of cotton seed is the predisposing cause of rot, and they are so liable to heat, how are we to manage to get clear of rot? I suggest this plan, which I believe is the plan which will succeed. Select a part of the crop purposely for seed; let this cotton remain without picking until a killing frost; then when the weather is cool, pick the cotton in dry weather, expose it to the sun and air every day until it is ginned, then sun and air these seed several days, until they are dry; now keep them thinly spread in a large room, opening the doors and windows when the weather is fair, frequently stirring them, and sunning them until planting time. Seed thus managed, I believe, will produce cotton that will not rot. It may be thought a troublesome and losing plan, but it should be noticed that as we at present plant cotton, it requires a great quantity of seed; a considerable part of them are so heated that they never vegetate, a still greater part vegetates, but so soon as they are out of the ground sicken and die; and although great quantities of seed are put in the ground, it is difficult to save a stand of cotton. With seed which are perfectly good, a bushel per acre would be an ample sufficiency; to save this much seed carefully would not be very troublesome. I am not more positive that I live, than I am that this is the true predisposing cause of rot, and that I suggest a plan that will succeed in preventing it. This opinion has been formed from careful observation, and many experiments.

I will attempt to give this opinion further proof by analogy. Corn, like cotton, is liable to rot; fortunately, the causes of rot in corn are well known, and we can, with certainty, prevent it; but were the cause unknown, we would, probably, be as much troubled by rot in corn, as we are by rot in cotton. Three things, it is well known, will cause corn to rot; when corn is gathered early, and put in quantity, it will heat, and have its colour injured: this heated corn will vegetate, but the corn it produces will rot very much. Also, corn ploughed when the ground is very wet rots. Again, corn planted several years on the same ground, without changing the crop, will rot. Suppose we were to gather our corn as soon as it was hard, put it in a close crib that it might heat, plant this corn on ground that had been planted several years in corn, and plough it when the ground was wet, we would escape well if one half did not rot.

Wherever cotton is largely cultivated, it is to be feared, with every precaution, the seed will be slightly heated, and a slight predisposition to rot produced; it would require, therefore, a total absence of exciting causes to totally prevent rot. It may, therefore, be expected that we will always have a little rot, many of the exciting causes being beyond our control; but as it would require strong exciting causes to produce much rot when there is little predisposition, and when there were weak exciting causes, the predisposition being weak, we would nearly, if not entirely escape. Taking all possible precaution, would render what exciting cause we could not control comparatively harmless. The strongest exciting cause is the continuance of wet weather. Last year the rains were uncommonly partial; many plantations and neighbourhoods were deluged with repeated rains, while other places, almost in sight, were suffering for want of rain. Not less partial was the rain than the rot; wherever the plantation or neighbourhood was very wet, the rot was very bad, and where there was a drought the cotton very much escaped the rot. This going together of rain and rot, was so common, that all who noticed, must have observed it. The predisposition to rot being nearly alike, the effect of this great exciting

cause was very obvious; but when there was less predisposition in the seed, although the exciting cause was the same, yet its effect was obvious. I could give a great many facts in proof of this; a few only will be named. My crop on the river, I observed, was planted from seed with strong predisposition to rot; it rained more there than any where in the neighbourhood, and my cotton rotted more than any I saw. Mr. Davis, below me, is a careful planter, and his seed were in a better condition. I was frequently there during the crop season; I often regretted his fate, his plantation was so dry that it looked like he would make nothing; he, however, had late rains, and he made the best crop of cotton I saw; he had no rot. But one of my fields where the rot was so very bad, was planted mostly with seed picked after frost, and which was never in a bulk—this part of the field had no rot. My crop here was planted with seed that were picked late, never in a bulk, and constantly exposed to sun and air: in this cotton I had no rot, it was also very dry, while Mrs. Nunnally, two miles from me, saved their seed in a close house and large bulk; they often had showers which did not reach me, and the cotton there rotted very bad. I say, not only does repeated rains greatly excite rot, but working the ground while it is wet adds greatly to the evil. On my place, where it was raining every day, I often found fault with my overseer for stopping the ploughs, and several times had them started; but as the ground was laid off horizontal, and held the water, I had to stop them until the ground could dry; these rows that were ploughed when the water would run after the plougs, could be distinguished by the rot being worse in them. I went to Mr. Ligon's plantation, and he had very little rot—his overseer showed me a spot of perhaps a half acre, which was rotted very much: this ground was rather hard, and he had it ploughed when very wet. I noticed many facts in further proof of this. Large cotton planters, in wet seasons, are forced to work some of their crop when the ground is wet, and as ploughing over again, as soon as the ground is dry, considerably counteracts its bad effects, an excellent mode of cultivating cotton is to run only one forrow on each side of the cotton rows, and, perhaps, a week after, running a deep large furrow in the middles; this makes one full ploughing have nearly as good an effect as two ploughings, and whenever the first ploughing was done in wet weather, being careful to run the middle furrow in dry weather, fills up the furrows, and covers the caked ground with dry earth, and thereby counteracts its bad effects.

If these views are correct, we would have large quantities of cotton seed to spare. Perhaps an inquiry as to the best use to make of them may not be misplaced. As food, they have an injurious effect; an opinion prevails, that the fine lint on the seed produces the bad effect, and throwing them in mud, &c., have been tried to prevent it; this is incorrect. We see a hog does not eat any of it: they chew up the seed and swallow only the nourishing part; but they will die from eating them. The fact is, they are of a rich oily nature, and have an injurious effect on the stomach of all animals that eat them—as food, they do more harm than good. The plan of making oil of them will never answer in a cotton making country; any person practically acquainted with making oil, will know that it must be a losing business. They are more valuable as a manure, as they are now used, than to be made into oil; but according to the present plan of using them as a manure, fully one half of their value is lost by their being rotted before they are put in the ground. If they are put in the ground unrotted, they

sprout and lose still more of their value. Whoever will take the trouble to crush a pint of seed, will find they will manure a corn hill more than a quart of rotted seed; also, rotted seed manures only one year, and crushed, will act as a manure for several years. If cotton seed were passed through rollers and crushed, so that they would not vegetate, it would be the most valuable mode of using them; but as this would require machinery, the next best mode of using them (and of this I speak practically) is this: a plantation which makes fifty bales of cotton, would have one thousand bushels of seed to spare; furrows should be run, and the seed deeply buried, at the rate of one hundred bushels per acre; for of all plans of manuring I think best of thinly scattering manure. This land would the first year produce five barrels more to the acre than it would without manure: next year, one third less, and next year, one third less, after which, not much effect would be produced. This increase of produce is without additional labor or expense, and is clear profit. Rotted seed, as a manure, should be valued at thirty cents a bushel; this is more than they are worth for oil, food, or any other use that can be made of them. If this seems an over calculation, I will relate an experiment. I manured one acre of this land with one hundred bushels of seed, and drilled with wheat, and it produced forty five bushels clean wheat; next year it made eight barrels of corn; the acre at the side of it, by rough measurement, made four bushels of wheat, and less than three bushels of corn, so that the seed, in two years, made about sixty cents per bushel.

ROBERT R. HARDEN.

Agricultural Schools.

[FROM THE BRITISH FARMER'S MAGAZINE.]

That the welfare of England is bound up with her agriculture, must be manifest, on a moment's reflection, to all who have not had their brains addled by the *economists*. It is, therefore, imperatively the duty of those who have power, to endeavour to make our agriculture as perfect as possible. With such view, I have proposed agricultural schools.

In 1790 a proposition for a system of national education, which embraced agricultural schools, was submitted to the National Assembly of France. But the author of the *projet* does not appear to have seen his way very clearly as to the education required, and I believe the scheme fell through as much from the imperfection of plan as any thing else. "Dans chaque canton," he says, "il faut un institeur rural, et peut-etre deux, ou trois quatre. Dans chaque municipalité, il faut un lieu vaste, couvert et fermé; là l'instituteur, donnera ses leçons. Lire écrire, apprendre à mesurer et à cultiver les champs; travailler sur ses métiers, faire des bas, des toiles ou des étoffes; apprendre la morale de l'éuangile, la morale de notre sainte religion, la déclaration des droits de l'homme et la constitution; manier les armes, faire des evolutions militaires. Tels seront les exercises des jeunes gens des campagnes, jusqu 'á l'âge des 15 ans."

In Switzerland there are agricultural schools in activity, and others springing up in every direction. The schools at Hofwyl, near Berne, and at Carra, in the neighbourhood of Geneva, are, or were, the most complete. To Monsieur de Fellenberg, the Swis will ever have to be grateful: such men, when we think of them, almost cause us to

forget we are on earth. There is much of whimsicality, however, in the mangement of the schools; and much is, or seems to be neglected, that should not have been. "The establishments at Hofwyl are of a very extensive description. About four hundred and fifty individuals are there collected together, and although divided into five distinct classes, with distinct objects in view, they form but one whole, of which each class forms a necessary part. 1. The institute, for about one hundred lads of the higher ranks of life, from the different European nations. 2. The school of the middling classes. 3. The poor school for boys. 4. The poor school for girls. Add to these the workshops, where agricultural machines, and every thing for the use of the different establishments, are manufactured; and a farm conducted upon the most approved principles of husbandry. The object of the founder, in thus bringing together the youth of every class of society, not, indeed, under one roof, but in one little colony, is twofold: 1st, To give the wealthier such a knowledge and interest in the poorer classes, that they may learn that not only the welfare, but the very existence of the state, depends upon this necessarily largest portion of the community. That this is the base of the social fabric, and if it be not solid, the superstructure, however splendid, must soon be precipitated in ruins:—and 2dly, That the poorer, from daily seeking research and scientific investigation, such as they cannot spare time to make, produce results of the greatest utility to all; and from the daily enjoyment of kindly intercourse with persons of refined manners, benevolently disposed towards themselves, may learn to look up to the richer with affection and respect, instead of distrust and jealousy; while they feel a moral certitude of being able, by the means of well-directed labor, themselves of attaining a higher sphere in society. *In the institute, study is the labor, and bodily occupation the remuneration; but in the poor school, bodily occupation is the labor, study the recreation.* As bodily labor is to form the principal occupation of the poorer boys throughout life, from childhood should they be habituated to it. Accordingly, to give them a habit of perseverance and skill, bodily labor is one, indeed the grand, mean of education. For ten hours a day do the boys labor in the fields or workshops, each performing work suitable to his age, strength, and ability. I have seen them at all hours, and never did I behold workmen more intent upon their duty. The master, the indefatigable Verghli, labors with them, instructing them in their duty, and at the same time seizing every opportunity to open their eyes to nature; any extraordinary production they may meet with is put on one side for examination when the day is done. As all they learn has a relation to the objects by which they are surrounded, the mind is continually interested while at labor, in the practical application of what they have learned. But giving the habit of labor is not sufficient. A man who labors for another, without himself having an interest in doing so, is a slave. It is, therefore, necessary that they should have some opportunity of directly and palpably perceiving the profits of what they do; and consequently, each lad has a little garden to himself, which he cultivates for his own advantage, and disposes of the produce to the establishment, which either pays him the money, or permits him to place it at interest in a little bank, which has been established for the purpose. Several sums of considerable amount collected there. The connection between labor and property being thus early instilled, not so much by precept as by practice, and the habit of patient labor so thoroughly acquired, there would be

little danger of persons thus brought up being seduced from pursuing their own interests by any of the allurements of the world. But as the man who labours without knowledge, will expend much time to little purpose; and the man who labours without having had the moral and religious sentiments cultivated, would do so merely for the sake of animal gratification or self-preservation; to improve the means, there must be knowledge; to ennoble the end must be morality and religion. M. de Fellenberg, consequently, does not stop short, but having obtained the safeguard, the ballast of the vessel, viz. the habit of labor, and a perception of its value, he proceeds to the cultivation of the intellect and moral sentiments—to give a capability of healthy action to every faculty of the human mind. 1. To give such a knowledge of surrounding objects as will enable the individual to form an accurate estimate of the relation of his own powers to them. 2. To increase the power of the individual, and consequently extend his dominion over nature: and, 3. To cultivate whatever faculties have a tendency to exalt the religious and moral sentiments, appear to be the principal objects of intellectual education. As the sphere is narrow or extended according to the rank in society, the objects to be known must be different, or rather, the points in which they are to be regarded are so. The skill of the instructor consists in directing the attention of his pupils to such things, and in such a manner, as will be found to be of the greatest utility to them in after life. The earth in his own immediate neighborhood, its products, and the forces, forms, and properties of nature, are the objects of the greatest interest to the peasant; as machinery, mathematics, practical geometry, some of the more valuable results of chemical experiment, and the skilful use of his hands are to the artizan and mechanic. A large room, containing all the natural productions of the surrounding country collected by the pupils themselves on a Sunday, or when at work in the week days, is a novel feature in a poor school. But it is the adaptation of the classification to the instruction of those to be taught that is so particularly interesting. Again, that every plant may be known by its parts, each plant was arranged, with its root, stem, leaves, flowers, and seeds, and that the children may know where each plant may be found, they are arranged likewise according to the height they grow in the atmosphere, which, in a country like Switzerland, is a matter of considerable importance. Specimens of the different descriptions of woods were also collected; and a museum of the animals, birds and reptiles of the neighborhood was commencing. It is the habit of accurately observing the actual nature of objects, as perceivable by the senses, and distinctly marking their differences, which, in after life renders a man intelligent and judicious. There are few whose natural faculties are so dull as to be unable to perceive a distinction when pointed out to them, or their notice is directed towards it—for instance, that one thing is long, another short; that one is round, another flat; one green, another black. But how few are there who, when minutely questioned, can give a clear, or circumstantial description of any object that they have been conversant with, or in what particular that object differs from another. And why is this? Because they have not the habit of accurate observation of things; and they have not that habit, *because, in modern education, a child's observation, at the moment when all is new, and observation most active, is wilfully drawn away from things to the signs of things; and the boy who might easily have been made to distinguish the nature and properties of the different objects around him, has only learned to distin-*

guish one letter from another. To give this habit of accurate observation—this habit of pausing to survey different objects—is one of the points most particularly aimed at in the cultivation of the intellect by the founder of Hofwyl."

The school at Carra is conducted on nearly similar principles. "During the day, the employment of the children is divided into manual labor and lessons, according to the common acceptation of the term. As is reasonable, the cultivation of the earth forms their principal occupation. They labour either all together, their master at their head, or divided into two or three bands, according to the nature of the work: in this case, the child in each band who has obtained the greatest confidence from the master, is charged with the direction of his companions, and renders an account of what is done. The children labor, in the first place, upon the land farmed out to the school, which was, in the first instance, nine poses, and will be fifteen next year. The product of this land is consumed entirely by the school. The rest of the time the children labor upon the land of M. Vernet Pictet, either by the piece, or for half the product, or by the day; in the latter case, the day is calculated by the number of hours of effective labor, being reckoned at nine hours the year round. This manner of reckoning leaves to the master the power of regulating the work of the children, according as he judges suitable, and to proportion it to their force, and the state of their health. Besides this, they manage two cows, two pigs, and some sheep; and thus familiarize themselves with that part of agricultural industry, which relates to the management of cattle. As they grow up, they will be employed in the work they are capable of performing. When employment in the fields is wanting, or the season does not allow them to attend to it, it is customary to occupy the children in a wheelwright's shop, (belonging to the school,) in separating wheat, basket making, plaiting mats and straw hats, knitting, spinning, assisting the tailor, the shoemaker, and the maker of wooden shoes, who are employed in the establishment to repair the children's clothes. The lessons, according to the usual acceptation of the term, comprehend reading, writing spelling, arithmetic, sacred singing, a little drawing, and some lectures for the purpose of preparing the children for the deeper religious instruction; which they receive from the clergyman of the parish. They are taught also, to know the names, the characters, and properties of the most common plants, which they collect, and dry themselves. The committee and the master acknowledge, that one of the greatest difficulties they have to overcome, is to render the education a child receives in the establishment, where he sees all his wants regularly considered and satisfied, and where he finds himself protected from a number of the dangers which he will be sure to meet with some time or other, as powerful and experimental as that which he would receive in a poor family, where instructed and formed each day, by *necessity, which is without doubt the best of masters,* he would be called upon to make, at an early period, an acquaintance with life such as it is, all filled with snares, seductions and dangers. The directors of the school do not flatter themselves that they have reached this important head, in their system of education, the height of their wishes. They avow even, that they despair of obtaining, in this respect, complete success. No instruction of man can supply the education which Providence gives us in the midst of the difficult circumstances of life. But their very apprehension has not been without advantage; they search and put into practice every thing which can, if not prevent entirely, at any rate diminish the evil which they fear.

The food is such as is found upon the tables of the laborers, who are frugal, orderly, and economical. The labor in the field, although proportioned to the age of the children, requires the exercise of strength and perseverance. The master forbids communication with persons unconnected with the school, only when there is danger, without any prospect of advantage. It is his endeavour, on the contrary, rather to make them acquainted with the society around, in which they are shortly to live, than to seclude them from it. He frequently charges the elder boys with selling, purchasing, and going upon commissions of every description; which, in bringing them to contact with a great number of persons of different characters and conditions, must necessarily make them acquire some experience of things, and of men. In fine, the conviction of the importance, and the difficulty of the problem, causes the directors to often make the thing the object of serious examination, and to neglect nothing which will give the most satisfactory solution possible. When there is a candidate for admission, the committee examine whether he has the physical requisites for his presumed profession. The daily labor is that of agriculture; the size of the farm has been gradually augmented: it is composed, at this moment, of 39¾ poses, of which 34¾ are arable, 2¼ pasture, garden and orchard, and 2¾ vineyard. The children are made acquainted with all the details of management which can excite their interest, and make of them one day enlightened agriculturists. The product of each of the pieces of ground, of which the farm is composed, being valued separately, it is to the boys themselves that the care of keeping the accounts is confided, and to make for each article the balance of expenses and receipts. The result, indicated in numbers, is a lesson upon the advantages that such and such a description of cultivation presents under such and such circumstances, of which an experienced master fails not to make them appreciate the influence."*

These suggest the schools proper for the education of the children of the laborers, the first point to be considered. The plan of the Carra establishment might be adopted with a few trifling amendments, which it will be time enough to talk about when it is likely the plan will be acted on. Without a well educated body of laborers, under the circumstances I contemplate, it would be like working with a team of poor horses: the work would be done, but how? There are, or have been, both here and in Ireland, schools for educating laborers; but from what I can learn, in the absence of authentic accounts, they are, or were, not the most efficient. If they are in existence, they should be revised by their philanthropic founders, for nothing can be more noble than such institutions. A "bold peasantry" are, truly, their "country's pride," but how much more the pride of their country should be a bold and well educated "peasantry," if that must be the epithet.

As schools for the bring up of scientific farmers, the Swiss offer us nothing of moment that we can follow. We must strike out a plan for ourselves. I propose to form, in each country, one or more farms, to be placed under the management of proper persons; and they should be sufficiently large to admit of operations on a tolerably extensive scale. I would by no means have mere garden practice. Each farm should admit a determinate number of sons of farmers, but none under twelve or fourteen years of age, as students of agriculture; and the students should be boarded and lodged on the farm. The labors

* Duppa.

of the farm to be performed, of course, by the students, when their strength was adequate to the task, and it would seldom be otherwise, for I contemplate having them of ages from fourteen to twenty. Of the arrangements for the necessary accommodation of the students, servants, and professors, I say nothing: they would suggest themselves, and I am not troubling myself with *minutiæ*.

The course of education on these farms, or agricultural colleges, should run through,

1. *The art of performing the manual operations of agriculture.* Too much care could not be bestowed on this head. On the dexterous and perfect performance of ploughing, digging, manuring, trenching, sowing, planting, hedging, thinning out, and the thousand and one operations the farmer has to perform, more depends, than at first thought appears.

2. *Simple mechanics.* A knowledge of the carpenter's art is of the most essential service to a farmer. Taking the country through, thousands of pounds are annually lost, from want of such knowledge. The carpenter is seldom at hand when he is wanted, and when he is ten or a dozen miles off, as is often the case, the odds are, that he is never sent for. If it were deemed necessary to go a little into the philosophy of mechanics, *Kater and Lardner's Mechanics*, would be amply sufficient for a text book.

3. *Land surveying, and the art of valuing rents and tillages.* These a farmer should be well acquainted with; but very few are. They should be taught by actual practice. There is much difference between theoretical and practical knowledge. For the first, *Crocker's Land Surveying* would be as good a text book as any, and for the latter, *Bayldon on Valuing Rents and Tillages.* As preliminary text books, I should recommend, *Smith's Lessons in Arithmetic*, and his *Evolution and Involution of Numbers:* there are no works in the language like them. The intermediate treatises are so numerous, and of such equal merit, that there is a little choice.

4. *Botany.* Systematical and Physiological; the latter to be studied with the utmost attention. Text books, *Lindley's Introduction to Physiological Botany*, and *De Candolle Physiologie Vegetale*, translated.

5. *Geology.*—So far as relates to the nature and position of rocks and strata, and of the formation of soils. A thorough knowledge of that part of geological science, would, frequently, be of great service to the scientific farmer. Theoretical geology I should pass over; not that it is of no importance, but that it is a species of knowledge that bears no relation to agriculture. My object would not be, to make geologists in the sense the term is usually understood. For a text book, I should recommend a translation of the *Manuale Geologico di Guiseppe Melograni*, with some few additions and subtractions to make it perfect for the purpose. I am not aware that there is any English work like it.

6. *Mechanical drawing.*—It frequently happens that farmers, when they wish an implement altered, or made to a shape of their own conceiving, have difficulty in getti ng it done, from the mechanic misunderstanding, or being unable to comprehend, written or verbal directions. A slight acquaintance with mechanical drawing would obviate such difficulties, and often save much expense.

7. *Animal Pathology, Physiology, and Veterinary Medicine.*—I would not attempt to supersede the veterinarian; but it is essential that the farmer should be acquainted with the causes and symptoms

of the diseases cattle are subject to, and of the remedies to be applied, in order to be able to treat them properly, in cases of emergency. Physiology should be carefully cultivated. Breeders are eternally falling into serious errors, from ignorance of it.

8. *Entomology.*—Only in relation to the mode of propagation, and the habits of the insects which are injurious to the farmer.

9. *Chemistry.*—Without a perfect knowledge of so much chemistry as relates to agriculture, (which would embrace a pretty general knowledge of it,) every other kind of knowledge would be comparatively useless. I need not offer a word in proof of this. *Turner's* or *Brand's Elements of Chemistry*, and *Davy's Agricultural Chemistry*, would be suitable text books: the latter would be indispensable.*

10. *English Grammar and Composition.*—These should be a main consideration. Improvement is generally the result of experience; and the more men communicate to each other the results of their individual experience, the more rapidly will improvement advance; as in the majority of circumstances, communication can be made by writing only, it is obvious the cultivation of that art is of paramount importance.

I know not that I can with propriety place *Galvanic Electricity* among the subjects to be studied by the agriculturist. My opinion is, that it should be studied, for it appears to me, that the effects of galvanic action, in the elaborating in the soil of the food of plants, should be taken into consideration. But I leave those to determine, who are better able to judge.

The works I have named as text books, sufficiently point out the extent to which I would have the school education of a farmer go.

To the schools there should be attached good libraries of books, on the subjects I have named, as of History, Voyages, Travels, Geography, Statistics, and such like; but not one volume of what is termed polite literature, for the moment a lad gets a taste of that sort of rubbish, it is good bye to every thing else.

Such a system of education as this, I am aware, can be made general only by its being made a national object; and that it never will be, as long as we are ridden by the "money-monster." Why do not the landlords shake it off? If they tolerate it much longer, they will have to find quarters in the ugly-looking workhouses they are now so busy building to put the laborers and broken farmers in, to starve them off. Every day, in the same breath that proclaims "national faith," they are told they must reduce their rents; and are held up, in prose and verse, as the most detestable wretches unhanged. Yet, the simpletons, they hesitate to retort in the manner they should. Boileau, somewhere or other, observes, *le plus sot animal, a mon a vis, c'est l'homme;* if instead of *l'homme* he had written *le proprietaire Anglois*, he would have been nearer the mark.

But much may be accomplished by private means; though not by the instrumentality of your bursting patriots, either whig or tory; for by them I have always found—as the devil found by the pig he sheared—more noise than wool. I need say nothing of the means: they are obvious; and any attempt at persuasion, to induce those most intimately concerned, to attempt to carry some such plan as I have indicated, into general or partial execution, would derogate from the importance of the object to be attained.

B. Donbavand.

* The private student should possess himself of *Faraday, on Chemical Manipulation*—it would save him a world of labour and disappointment.

On the Culture of Ruta Baga.

[FROM THE BALTIMORE FARMER.]

Mr. James M. Lawton, in a communication in the Cultivator, gives the following rules for the preparation of the soil, and the culture of the ruta baga. The conclusions at which he arrives are the result of many years experience and close observation.

1. The land, he says, properly adapted to the nature of the plant, is a strong loam.

2. The land should be ploughed early in the spring, in order that the sward, if it have one, may rot by the 10th of June.

3. The land should be made perfectly mellow and smooth, and a good coat of manure that is fine, say sheep or barn manure, should be put on.

4. Throw the land into ridges, twenty-four inches apart, with a small horse plough.

5. Roll down the ridges by a light roller, or other instrument; make a light furrow, say an inch deep, drill in the seed, on or about the 15th of June: the seed should be ten inches apart in the drill, and when the plants come up, all but one plant should be pulled up.

6. Dress the plants three times in a season, that is, keep the weeds out, and the earth stirred about the plants; as they are first breaking the ground, they must be powdered with plaster of Paris, and twice afterwards also, when they receive the two last hoeings.

Mr. Lawton further adds, that he has found the above rules, when closely followed, never to fail in producing a good crop; this last year he raised, from 90 rods, that is from half an acre and ten perches of land, 605 bushels of sound, close-grained ruta baga turnips, on land a distance from the house and barn, on which, never to his knowledge, a spoonful of manure had been placed, until within a few days of the time he put the seed in the ground. This product was equal to 1075 5-9 bushels per acre. The success of Mr. Lawton should surely serve to stimulate every farmer and planter to appropriate at least an acre or two to the culture of this excellent and hardy root. Unlike the other members of the turnip family, it will preserve through the hardest winter in the field, if the precaution be taken to throw a furrow up against the rows, just as the hard frosts set in, and may be drawn thence for use, as occasion may suit. They are also more firm in meat, and more nutritious than any other turnip. Horses and cows that feed upon them do not scour, as when kept on the other varieties.

A Chemist's Life saved by his Art.

[FROM THE NEW-YORK MIRROR.]

It is said that Mr. Chaptal, a celebrated chemist, was under the sanguinary reign of terror, in the first French revolution, one of the numberless proscribed victims of the then ruling faction, and in momentary expectation of being led forth to the guillotine. At that period Europe was dependent on the East Indies for a supply of nitre or saltpetre. The French army, with the enemy rapidly approaching on Paris, were reduced to the last extremity, by the want of that important munition of war, gunpowder. The supply of saltpetre, from

the East Indies, was wholly in the hands of the English. the exportation of which, as a material of war, was rigidly prohibited by the government. In this critical dilemma, Chaptal, known as the ablest chemist of that period, was applied to. A proposition was made him: his life would be spared, if, by his chemical skill, he could furnish the government with saltpetre. The condition of this requisition was most welcome—his life was safe. Chaptal immediately ordered a general excavation of the numerous cemeteries of Paris; the sepulchral repose of remote generations was invaded; old monastic buildings, which, for ages, had been imbibing animal effluvia, and generating nitre, were rased; the owners of ancient buildings were compelled to consent to their demolition, with the benefit of having a new house erected on the site; the walls of the subterraneous caves and cellars of Paris were scraped, and the earth of the floors dug up, all of which, to the republic, was more precious than gold. After removing the bones of more than two millions of bodies from the various cemeteries to the subterraneous quarries of the *Barrier D'Enfer*, (which gave existence to the celebrated catacombs) Chaptal, by chemical art, extracted from the various materials he had thus obtained, an abundant supply of saltpetre, and thus France and himself were saved. By the various governments that succeeded, Chaptal was always honored and regarded as one of the greatest benefactors to his country, and his talent and services, in this respect, were again placed in requisition by Bonaparte, who having, in accordance with his famous Milan decree, prohibited the importation of colonial produce coming through England, Chaptal was the first to suggest, and carry into operation the extraction of sugar from the beet root. Bonaparte created Mr. Chaptal a count, and peer of the Empire, and for many years he was a member of his cabinet, as minister of the interior.

Profits of Cow Keeping.

[FROM THE MAINE FARMER.]

Mr. Holmes,—No branch of husbandry is more profitable than the keeping of cows, if properly managed. We have but few farmers in the state of Maine, who make great profits by the dairy. Many farmers among us are solicitous to improve their breeds of cows, and some raise considerable quantities of good roots, with which to feed them during the winter. This is all very good, so far; but what is the treatment of cows during the summer season—the time when all, or nearly all, the profits are obtained? Cows kept in dry, short pastures, in summer, will not be profitable to their owner, however much ruta baga, mangel wurtzel, or carrots, have been fed out to them during the winter. I believe it to be a fact, that cows, generally, (some few exceptions,) are shamefully stinted in their food during the summer, in our state, notwithstanding our grazing lands are excellent.

I believe that the most profitable way of keeping cows through the summer, is by soiling, or feeding them with grass in the barn or yard. This may frighten some farmers, and excite the ridicule of others; but I think it will be granted, that he is the best farmer who realizes the greatest number of dollars and cents, from a given quantity of land, with the least amount of labor. Many farmers pride themselves on raising great crops; and 100 bushels of Indian corn have been raised on a single acre. This is a great profit, but I believe that three

thousand bushels of ruta baga may be as cheaply raised, take one year with another, as 100 bushels of corn. Three thousand bushels of ruta baga will give about a bushel and a half a day, each, to six cows, throughout the whole year. It is easy enough to see that cows, fed in this way, will be in excellent condition, and yield immense quantities of butter and cheese.

The method of soiling, as described by Mr. Dean, was to feed cows with new mown grass: an acre of rich ground, he says, will summer a number of cows. A little hay or grass will indeed be necessary at all times of year, but I believe roots should be raised in great abundance, and be made the chief article for feeding milch cows throughout the year, as far as practicable. Cows do not, generally yield great quantities of milk till June; but by supplying them liberally with roots, they may be made to yield as much milk in March, April, and May, as any part of the year. Farmers, whose cows calve early, and who have an abundance of roots, may make prodigious quantities of butter and cheese early in the spring. But how shall the farmer contrive to have a constant supply of roots throughout the summer, and until early root crops are ripe enough for use? This is a question of immense importance.

Ruta baga will keep well till July, and is it not possible, that by some kind of management, this root may be preserved in good condition nearly, or quite through the summer? We have an account of an Englishman who buried some potatoes deep in the earth, so deep that their vegetation was prevented, and the potatoes, when kept two or three years, were of as good flavor and quality as when first ripe. It is believed that potatoes may be kept through the summer without sprouting, in a common ice cellar. It has been contended, that potatoes will not sprout where ice will not melt. Chemists pretend to describe the means which nature employs in the process of vegetating or sprouting. Cannot chemistry tell us how some of those means can be withheld, or so managed as to prevent, or at least retard, the sprouting of vegetables? Would not a summer cellar, made air tight, answer our purpose? Air is necessary to the process of vegetation, and if we exclude air from vegetables, will they sprout? Cannot Yankee ingenuity devise some scheme to prevent vegetables from sprouting during summer? It is to be hoped that some of our enterprising farmers will try various experiments on this subject, as the accomplishment of the object above named would be of immense advantage to every farmer who cultivates roots. If it should be impracticable to preserve roots, in good condition throughout the whole summer, I believe that if our farmers practise soiling, they will realize an ample profit by their cows. At the worst, the farmer may have a constant supply of roots for his cows, except about six weeks, from the first of July till the latter part of August, and during this short period, he may supply his cows with other food. A steam boiler is of immense advantage to every farmer who cultivates roots. Dr. Dean says, that a steam boiler is made by setting a kettle, holding twelve gallons or more in a furnace made of brick or stone, and over this a hogshead, with one head taken out, and the other bored full of holes. With such a steam-boiler a farmer may cook the food for his milch cows with very little fuel, and with very little labor.

It is said boiled or steamed clover hay will serve to keep swine through the winter, and may not this article help to support milch cows when the other kinds of food are scarce?

Farmers in Europe, and in this country have practiced soiling their cattle during summer, and those who have had great experience in this mode of summering, have declared it to be a much cheaper and more profitable mode than grazing.

Much has been said and written, of late years, in regard to the great profits of root culture, but the farmer who keeps a poor breed of cattle, sheep and swine, and whose cows in summer range in a dry, short pasture, will never realize great wealth, however great his advantages may be in other respects.

The practice of soiling cows, in our state, would certainly make a great saving of land, and of course it would give to farmers a larger pasture for sheep—more land could be spared for the culture of wheat —and last, not least, more land could be spared for the cultivation of mulberry trees.

Immense quantities of manure could be made, especially by those farmers who are not afraid of a little labor in hauling muck, loam, and other materials calculated to absorb the urine of animals, which is, most commonly, entirely lost.

Our climate is extremely well calculated to keep butter and cheese in an excellent condition.

The state of Maine may be the first dairy country upon earth; our butter and cheese might be of such quality, that it would be eagerly sought after throughout the United States and the British Provinces; our farmers might easily acquire wealth and independence, if there was a little more enterprize. R.

Directions for the Cultivation of Watermelons and Cantelopes.

[FROM THE FARMER'S REGISTER.]

Enclosed I send you memoranda for the management of watermelons and cantelopes, by a gentleman who, in 43 degrees of north latitude, frequently raises melons weighing from 30 to 40 pounds. If the same pains were taken in the south, how fine and large we might grow our melons.

Your obedt. servant, —— ——

Holes, 2 feet diameter, 20 inches deep, filled 1 foot with garden rubbish and unrotted manures, beat down hard, and watered, (two or three buckets full,) then filled to the top with rich soil: on this spread an inch of fine compost or well rotted manure, compact, but not hard. Stick the seeds—(say twenty or thirty to a hill,)—the upper end of the seed to be a little below the surface of the compost; brush over the hill with the hand, so as to fill the holes made by the fingers; then cover the hill with an inch of clear *sand*, often watered. In Alabama, I should think, grass turf, (the grass side down,) would be a good filling for the 12 inches.

Hills, 10 feet apart, 2, 3, and at most, 4 plants only to remain in a hill, and standing apart from each other: thinned by the time the plants have 6 leaves.

If the season be dry, dig down by the side of the hills nearly as deep as the bottom of the holes, and put in a bucket or two of water—filling the hole after the water is absorbed: as soon as the yellow bug is gone take away the sand, and supply its place with soil. This is all that can be done in the hill.

When the plant has six leaves, take off the centre shoot with the point of a sharp penknife, and when the lateral shoots are six inches long, take off all but three: when these begin to fall to the ground, secure them down with cross sticks; and as they advance, spade up the ground, foot deep, in advance of the vines.

Once in every three or four feet, put a shovel full of soil on a leaf joint of the vine, (not covering up the leaf,) and press it down gently with the foot on both sides of the leaf: if this is kept moist it will take root. The ends of the vines to be kept to the ground with cross sticks.

Let the vines spread from the hills, so as to cover the whole ground.

If the side branches of the main vines are inclined to head up, and not to keep to the ground, take them off, say a foot from the head of the main vine.

All pruning to be done in the middle of the day, when the sun shines.

Let no melon set within 4 or 5 feet from the root; and then only one on a lateral branch, three to a plant. Let the vine run on as far as it will—keeping it to the ground: permit no melon to grow that is deformed: pull off no male blossoms.

When the melon is nearly to its size, others may be permitted to set on the same vine, and a second crop raised. I should think the vines might be made to grow from 20 to 30 feet long.

Great care should be taken that the vines are not moved or trod upon.

The *early* but *small* melons. Let the melon set at the 2d or 3d leaf-joint from the root, and take the vine off two joints beyond the melons.

To increase the number of cantelopes. Take off all the melons that set within two feet of the roots.

These may be planted 6 feet apart, 4 to the hill, and require no particular attention.

Sand on the hills, is one of the best preventives against the yellow bug, though not entirely a preventive.

Important questions in Husbandry should be settled.—No advantages gained by cutting up Corn, when bitten by a Frost.

[FROM THE GENESEE FARMER.]

There are, in relation to practical husbandry, very many important questions, which remain yet to be settled. Nothing could contribute more successfully to the advancement of the rural arts, than to bring such questions to a satisfactory solution. The questions to which we allude, are, indeed, very numerous. Scarcely any truth, in relation to the practice of agriculture, is so well, and so generally ascertained and established, as to command universal belief, and produce uniformity in practice. In regard to almost every thing that comes within the province of agriculture, practical men entertain different opinions. Yet it is an unquestionable truth, in relation to every sort of business under the sun, that there is one right way of doing it, and that there is no other way equally good. When two or more farmers differ in their opinions, relative to practising any specific branch of husbandry, they may, indeed, all be wrong, but it is certain they cannot all be right.

It is very desirable that the important questions which so frequently arise, in relation to the practice of agriculture, should be settled in a satisfactory manner. Gentlemen of scientific and practical attainments, who delight in rendering themselves useful, as the patrons of agriculture, should, with a single eye, aim at such objects.

Important questions, in relation to the advantages of using plaster, the manner of its use, and the manner also of its action, remain yet to be settled. The public mind needs to be farther enlightened on these subjects, for it is obvious that farmers do not, in general, avail themselves to so great an extent as they might, of the advantages to be derived from the use of this mysterious article. Important questions relative to the best methods of cultivating the wheat crop, the corn crop, and all the other crops connected with the husbandry of the country, also remain yet to be settled. There are, also, yet to be settled, questions of the highest importance, relative to the advantages to be derived from the culture of roots, together with the manner of their culture, and the most profitable uses to which they can be applied. We see, already, that an immense field lies in view, affording unlimited scope for inquiry, and for investigations relative to the agricultural interests of the country.

To these general remarks, we add two specific questions, selected, not only because they are intrinsically important, but because they frequently occur, and, no less than others, divide the minds of farmers. 1. If corn, while in a state of imperfect maturity, be bitten and injured by frost, will anything be gained by cutting it up. 2. Is it profitable, in ordinary cases, to cut up corn at all, or to cut up the stalks while the ears are attached to them? In answer to the first question, we shall now offer some remarks, and to the second we may respond at another time.

At the time of the great frost in September, we happened to have a small field of corn, which was badly injured by that frost, and what to do with it was to us a perplexing question. Having, however, a slight impression, that something might be gained by cutting it up immediately, we went at it, and cut and put up, with our own hands, as much, perhaps, as grew on the fourth of an acre. But finding that the work was toilsome, and having some misgivings as to what might be the consequences of it, we concluded to discontinue our labors, and abandon the crop to its fortune, whatever it might be.

The results of this experiment, were such as fully to sustain in the opinions entertained by the old farmer of Waterloo, as reported by the editor of the Farmer, who was present and heard the conversation. The conversation turned on the question, what should be done with corn that had been stricken with the frost? The old farmer said that corn would ripen when deprived of its tops by the knife, and why should it not ripen, when deprived of its leaves by the frost? But the leaves were not all killed, and the juices were fresh in the stalks. He thought the best management was to let it alone." We are satisfied that the old farmer gave wise counsel—that his reasoning was logical, and his opinions correct. On subsequently examining the results of our experiment, we were not able to discover that the corn, which had been cut up, had, in any respect, the advantage of that which had not been cut. The difference in quality was not, indeed, very striking, yet there was a difference, and it was decidedly in favor of the uncut corn.

In relation to this experiment, we submit the following remarks: 1. Several of the stocks, although put up as well as well as we knew how to do it, got down, and suffered by exposure to the weather. In such cases, the corn was sadly damaged. 2. No part of the corn that had been cut up, came in so well as that which had not been cut, while some of it was badly injured by exposure to the weather. 3. If any advantages were gained by cutting, they were to be found only in the greater value of the stalks for the use of fodder. Were these sufficient to balance the expense of cutting and putting up, together with considerable loss in damage to the crop? This we doubt. We think, as did the old farmer of Waterloo, that when unripe corn is stricken with frost, the best way to manage it, is, to let it alone.

DAN BRADLEY.

"Nothing is beneath the Attention of a Great Man."

[FROM THE GENESEE FARMER.]

This short sentence is inscribed over the door of the small building in Holland, which was once the workshop of Peter the Great; and furnishes more than volumes of common description and history could do, an insight into the character of the man who raised the Muscovites from the deepest barbarism to the rank of civilization, and laid the foundation of an empire, the extent of which the world seems as yet little able to comprehend.

One of the most fatal errors to which men are subject, is the disposition to treat small things with contemptuous indifference; forgetting that great things are but an aggregate of small ones, and that discoveries and events of the greatest importance to the world, can be traced to things most insignificant in themselves. Nothing more truly marks an original mind, and stamps its possessor as a truly great man, than the seizure of circumstances which would pass unnoticed by the great multitude, and by subjecting them to the powerful analysis of his reasoning powers, deducing inferences of the greatest practical results.

The power of the loadstone to attract iron, has been known from time immemorial; accident discovered the fact, that a magnetic needle would indicate the north; but for a long time this truth was productive of no results. In the hands of Flavia Gioja of Amalfi, it produced the mariner's compass, an instrument which has changed the whole course of commerce, and opened America and Australia to the rest of the world. To mention only one of the things that the use of the compass, in maritime discovery has led to—it has given the potato to Europe, and thus trebled the means of subsistence, as well as doubled the population.

We owe the Galvanic or Voltaic battery, one of the most powerful instruments in advancing science the world has yet seen, to Madame Galvani's noticing the contraction of the muscles of a skinned frog accidentally touched by a person on whom her husband was, at the moment, making some experiments in electricity. The experiments of Galvani and Volta were followed up by Davy, Hare, and Silliman, and effects which have astonished and instructed the world, have been the result. The dry Galvanic pile, in the hands of the discoverer, De Luc, was nothing more than a scientific plaything. Singer, of London, a mechanic of genius, saw the pile, and applied the power thus generated, to move the machinery of a watch; and one con-

structed by him has now run more than 16 years without winding, or loss of motion.

A chemist was at work in his laboratory preparing a powder for a certain purpose. A spark fell into this composition, and it exploded; and from that day gunpowder was discovered. Some may question the utility of this discovery, but we do not. Gunpowder has materially aided the miner, the founder and the chemist; but more than all, it has given internal order and tranquillity to the kingdoms of Europe, by knocking down those strong holds of feudal barbarism and cruelty, the castles of a haughty and domineering nobility, and placing the weak, so far as regards protection by law, and security to person and property, on a level with the highest.

A German peasant carved letters on the back of the beech tree, and with them stamped characters on paper for the amusement of his children. Nothing more was thought of them; but from them Faust conceived and executed moveable type; and printing, an art that perhaps has exercised a greater influence on the destiny of mankind than any other, thus had a beginning.

Galileo was in a church at Florence, where a drowsy Dominitian was holding forth on the merits of the Virgin, and the miracles of the Holy Church; things about which the philosopher cared very little. The principal lamp of the church had been left suspended in such a manner that it swung to and fro in the slightest breath, and caught the eye of the philosopher. The regularity of its oscillations struck him, and the idea of employing such vibrations to measure time occurred. Galileo left the church, and returned to his study, and in a short time the first pendulum ever made was swinging. Some children, playing with glasses of a Dutch spectacle maker, accidentally placed two, so that the steeple of a church appeared much nearer, and turned bottom upwards. From this small beginning was produced the telescope; an instrument which, more than any other, has enlarged the boundaries of the universe, and given to man more exalted ideas of that Being, who spake all these worlds into existence.

About one hundred and fifty years ago, an old man might have been seen in his study, apparently amusing himself by witnessing the escape of steam from an old wine bottle, and then checking it by instantaneously plunging it into the cold water. There are multitudes who would sneer at an observer of nature, who could stoop to notice such a trifle; yet this expansion and condensation of steam in the wine-bottle, and the train of thoughts which it suggested, in the hands of the Marquis of Worcester, gave birth to the steam engine, the most valuable present science has ever made to the arts. These very men, who are now filled with delight and astonishment when they behold the beautiful steamboat majestically ploughing the waves, or the steamcar whirling its train of carriages over the railroad, with almost the rapidity of thought, would be the first to look and speak with contempt, on the train of small causes that led to such important results.

But perhaps the example of Newton, more than any other, conclusively proves that there is, in the whole circle of nature, nothing trifling to a truly great mind. Thousands had seen apples fall from the trees to the earth; yet no one had ever asked the question whether the cause that caused the apple to fall to the earth, extended to the moon? —yet this question, and its solution, was the key that has unlocked the mechanism of the universe, and given to man powers and ideas which could, otherwise, never have existed.

The great truth these examples inculcate is this—that there is nothing trifling in nature, nothing that is not worthy of attention and reflection, nothing that does not form part of the great chain of cause and effect, and consequently capable of leading to the most valuable and interesting events. There is a feeling abroad, that it forms no part of the business of the tiller of the soil, to think. This is not true, and the position should be exploded at once. It is scarcely possible for a man to be more favorably situated for an observation of nature, than the farmer. His business is with the soil he treads upon, with its various constituents, and their ever varying proportions; with the green earth, and its covering of grapes and plants, its flowers, while over the head is stretched the broad o'erarching sky, inviting him to useful reflection, and urging him to "look through nature up to nature's God."

Scientific Farming.

[FROM THE HAMPSHIRE GAZETTE.]

Formerly there was a great prejudice among farmers to uniting knowledge acquired from books, with experience, in their agricultural labors. This prejudice is fast dying away, but probably still exists, in some degree. It was thought that any education, beyond a common knowledge of reading, writing, and cyphering, was entirely useless to the vocation of the farmer. But such ideas are very erroneous.

It is never deemed useless for the machinist to possess some knowledge of the science of mechanics, or for the architect, of the science of architecture; they must have such knowledge, to be expert in their profession. Then why is it not important for the farmer to study the science of agriculture? But what is the science of agriculture? It is that science which treats of the nature of plants, soils, and manures. It makes known the composition of soils, and the kind of manure and particular plants that are adapted to certain soils. Also, the effect which will result from a particular treatment or cultivation. Most of this, it is true, may be learned by experience; but experience alone does not give a man that assurance of being right, which he possesses by uniting science with experience. If he trusts to the latter wholly, he is compelled to tread a beaten path, or move with much uncertainty; while, on the other hand, the intelligent, scientific farmer may strike out a new track, try some new experiment, or adopt some new mode of culture, and be able to calculate beforehand, nearly what will be the result. He acts understandingly. He knows, in the first place, the nature of the plant he wishes to cultivate—suppose this be the opperation to be pursued—in the next place, the soil and manure adapted to it, and finally, the mode of cultivation which its growth requires. All this he knows, without having gone through with the process of experiment.

But the value of science, in the labor of agriculture, may be made more clear, by reference to facts. Who are the farmers that are most successful and prosperous? Are they not those who read and study agricultural works, and search out the best modes of cultivation? What farmers are they who obtain premiums for reclaimed lands, and the largest crops of corn? Are they not scientific farmers? those who exercise the mind, as well as the body, in their operations? It is so, to the extent of our observation.

One or two facts fell under our observation, during the short space, in early life, that it was our lot to be a 'tiller of the ground.' The farmer

with whom we resided, had a piece of mowing land, which, during remembrance, had not been ploughed, because his father said, if it were ploughed, it never after would yield good crops of grass. The farmer's son, however, did not place implicit confidence in the wisdom of his grandfather, and obtained permission, after much persuasion, to plough the land. It was planted with corn and produced a very large crop. The next year it yielded an excellent crop of oats, and for three years succeeding, more grass each year, than had been cut from it any two of the thirty preceding years. Now had this farmer been intelligent, he would not have believed, for a moment, that ploughing would injure that piece of land.

Another fact. This same farmer had a swamp, covered with nothing but alder-brush, and dog-wood, through which a brook run, that was used for irrigating his mowing land. His father told him that if that swamp were cleared, the brook would dry up. But this grandson was faithless here. He took his axe and stub-scythe, levelled this swamp, burnt it over and put it under process of reclaiming. But what became of the brook? Why, it continued to run in its accustomed channel, with the quantity of water, so far as perceptible, undiminished. Here again had the farmer been well informed, he would have known that clearing the swamp could have but very little effect uponthe brook. It laid it more open to the sun's direct heat, which would subject the water to a little more rapid evaporation, and that is all. But we have pursued the subject farther than we intended to, and will here close.

Heating by Hot-water drawn up from the Bowels of the Earth.

[FROM THE GENESEE FARMER.]

It seems to be now proved beyond dispute, that the temperature of the earth increases from the surface downwards; and consequently, at a certain depth, the heat of water must be at the boiling point; and at a still greater depth, all materials whatever must be in a fluid state. At the meeting of the Bristol Association in August, 1836, Professor Stevelly suggested the idea of bringing up hot-water from the bowels of the earth to the surface; and heating houses, manufacturies, &c., with it, so as to keep them at a given temperature, in the same manner as is done with the apparatus by water artificially heated. (*Lit. Gaz.*, Sept. 3, 1836, p. 551.) As, at a certain depth, the water must be at such a degree of temperature, as when allowed to expand, it will instantly become high-preasure steam, it seems not altogether impossible that our stationary steam engines may be supplied with that material without the use of fuel; and hence those who look forward with fear to the period when the coal mines will be exhausted, may derive some small degree of consolation. At all events, it seems not unreasonable to suppose that, if a bore or Artesian well is carried so deep as to penetrate into a stratum of water at a sufficient temperature to expand itself into steam, there will be no difficulty in the water ascending to the surface. If ever so complete a command of water should be obtained by man, in every part of the world, except of course the frozen zone, the climate and culture of the whole would be altered: and who can tell what may be the ultimate result of the operations of man in one way or another, chemically, electrically, and mechanically, upon the globe?—*Loudon's Gardener's Magazine.*

PART III.

MISCELLANEOUS INTELLIGENCE.

A Thousand Dollar Ox.—A great ox fattened by William Felt, Esq., of Madison County, was sold to Sandy Welch, who keeps the great eating house corner of Broadway and Ann-street, and Mathew Harpel, of Washington market, for the round sum of one thousand dollars. It was estimated that the quarters of meat would weigh five hundred pounds each.—*N. Y. Jour. Com.*

Valuable Cow.—The Salem Gazette chronicles the death of "old Star," a cow belonging to Samuel Bradstreet, of Topsfield, at the age of 21 years, which had cost him, from her birth $330, and yielded him, in calves and milk, $1539 20 —leaving a balance in her favor of $1200 20.

Death of Grant Thorburn's Father.—Died at Dalkeith Scotland, on the 11th of Feb., Mr. James Thorburn, Senior, aged 94 years, father of Grant Thorburn, of New York. He was the third generation from the persecuted Covenanters, referred to in Scott's "Old Morality." He remembered Prince Charley and his rebel army, passing the house where he dwelt, marching to the battle of Preston Pans. He was 75 years a member of the church; and lived the life, and died the death of a Christian.

Agriculture is an Art.—Man is the artist; the soil his laboratory; manure his raw material; animal strength and machinery his power; air, heat, and moisture, his agents; and grain, roots, fruits, and forage, his product.

Agriculture is a Science.—which teaches the artist the best mode of fitting up and improving his laboratory; instructs him in the properties and economical use of his raw material; learns him how best to apply his power and to profit by his agents; and it thereby enables him greatly to abridge his labor and multiply his products.

The art teachers the hands *to do*; the science *what* to do, and *how* to do. Art is the sail which propels the ship; science the compass which directs her course. Without the sail, the ship would not "go ahead," without the compass, her course will be erratic, and the profits of the voyage doubtful. With sail and compass, her progress will be "onward," her course direct, and her voyage prosperous.

Long Rope.—Mr. Grimshaw, at Sunderland, lately finished the longest rope known. It was over four thousand yards long, seven inches in circumference, and twelve tons in weight. It will cost £400, and is made for the use of the London and Birmingham railway.

Stephen Girard.— The income of the estate of Stephen Girard, deceased, for the year 1336, was $413,000. 'The greater portion of this sum is appropriated to the Girard College, to which 153,000 were appropriated the previous year. It is said the Institution, when completed, will be the most splended in the Union.'

Money.—The income of the Marquis of Westminster is £1000 per day!

Mr. O'Connell.—Daniel O'Connell lately received a singular letter from Ireland, written in a female hand, inclosing notes for £100. The communication runs:—'A tribute of gratitude to Mr. O'Connell, for making Ireland respected.'

Embalming.—The Boston Medical Journal states that if the bodies of men or animals be plunged for some time in a solution of corrosive sublimate, and afterwards dried, they assume the consistency of wood, and the air produces no effect upon them; and if the bodies be injected before they are plunged into the liquid,

they will retain the color and appearance of life, and consequently form mummies far more perfect than the Egyptian.

—

Ladies' Corsets. Mr. John Hand, of Somerfield, Pa, gives notice that he has invented a very simple apparatus to be attached to ladies' corsets whereby the delicate little creatures may be compressed into the compass of a hoe-handle, by the gentle drawing of two strings which can be tied in front.

—

The Better Currency.—There can be no doubt that the promise of General Jackson, to give the nation "*a better currency*," has been fulfilled.—Money was worth but *six per cent* a year. It is now worth *thirty-six per cent.* and can scarcely be had for that. Is it not therefore "*a better currency*!"

—

Chinese Carving.—In carving wood and ivory and other substances, the Chinese have no rivals. We can not approach them in their ivory work-baskets, fans, and other articles; no European artist, we believe, has ever attempted to cut out from one solid ball of ivory, seven or eight interior ones, each separate from the rest, and as beautifully carved as the exterior one. These are all cut by the means of the several circular holes that are, in the first instance, boared through the solid ball.—*Quart. Review.*

—

Schoolmasters.—In every age even among the heathen, the necessity has been felt of having tutors and schoolmasters, in order to make any thing respectable of a nation. Since then every state must needs have such, and since the great defect and complaint is that we have them not, surely we are not to sit and wait until they grow up themselves. We can neither chop them out of wood, nor hew them out of stone, and God will work no miracles to furnish that which we have means to provide.—*We must therefore apply our care and money to train up and make them.* For whose fault is it, but that of the government, who allow our young people to grow up like trees in the woods, and bestow no pains on their education? It is an inhuman wickedness for men to say, "Let things go as they may under our government—we care not what happens to our posterity." Such rulers should govern, not human beings, but dogs and swine, for they seek only their own gain and ease.—*Luther.*

—

Paper.—A French chemist has invented a kind of paper for banking purposes which will render counterfeiting or altering notes almost impossible. The slightest touch of acids, to efface what is written or printed on it, will leave a stain which cannot be obliterated.

—

Yankee Enterprize.—The American Missionaries are publishing in modern Greek, the Penny Magazine, at Smyrna. The title is "Apothki Ton Opkelimongnoseon," (Magazine of useful Knowledge.)

—

Mrs. Duff and Wallack.—Mrs. Duff and Wallack have been at Vicksburg. In speaking of the performances of the latter, the Sentinel of that place says, "Twenty years ago, who could have dreamt that at this day the same actor who then received the plaudits of an audience at Drury Lane, would in a few weeks after, be electrifying crowded and fashionable houses on the banks of the Mississippi, 500 miles from its mouth, in the midst of a country then in the undisputed possession of the Choctaws."

—

The Tailors done over.—A master Tailor of Amsterdam, named Welland, a German by birth, has invented a machine which performs the task of sewing a garment as well as it can be done by the hand. The King of Holland has just presented him with one hundred ducats, but the tailors have vowed vengeance against him.

—

Orthographical Analysis of "Devil."—A Methodist preacher at South Shields, after remarking on the appropriateness of the above cognomen to the person designated by it, added—"The whole name is *bad;* if we take away the first letter, it is *evil;* take away another letter, it is *vile;* take away the next letter it is *ill;* and the last letter itself has the sound of *hell.*

—

Toads.—It is a common notion that these beautiful little animals suck poison from the earth. Now although this opinion is a fallacy, the toad is, nevertheless, one of the most useful animals in the world to the gardener. The toad lives entirely on animal food, eats it alive, and cares not a fig for Dr. Graham. The

grubs and insects which he devours are very injurious to the young plants which are cultivated for the table. He comes out at night when the dampness of the air is agreeable to him. and when his prey are likewise wandering abroad, committing their depredations, and watches them as eagerly as a cat watches for mice. It is said that a few dozen of toads will destroy all the cabbage worms in a whole acre of land that is planted with cabbages, and be the means of saving the young plants from destruction.—*Boston Paper.*

—

Gin, Oxygin and Hydrogin.—While a philosophical lecturer in England was describing the nature of gas, a lady inquired of a gentleman what he meant by *oxy-gin* and *hydro-gin*? or what was the difference? "My dear Madam," said he, "by *oxy-gin* we mean *pure gin*, and by *hydro-gin* we mean *gin and water.*

—

Anecdote.—What are you thinking, my man? said Lord Hill, as he approached a soldier who was leaning, in a gloomy mood upon his firelock, while around him lay many mangled thousands of French and English: it was a few hours after the battle of Salamanca had been won by the British. The soldier started, and after saluting his General, answered, I was thinking my Lord, how many widows and orphans I perhaps have this day made, for one shilling.

—

Pleasure.—Would you judge of the lawfulness or unlawfulness of pleasure, take this rule: Whatever weakens your reason, impairs the tenderness of your conscience, obscures your sense of God, or takes off the relish of spiritual things; in short whatever increases the strength and authority of your body over your mind, that thing is sin to you, however innocent it may be in itself.

—

Rain guage.—Many who are curious enough to know how the depth of rain is ascertained, and perhaps to test the same, can learn the following simple method. Take a funnel, whose large orifice is exactly ten inches, and fix in a bottle. The descending rain will fall into the funnel, and from thence into the bottle. The quantity of rain caught is then ascertained by multiplying the weight in ounces by 173, which gives the depth in inches and parts of an inch.

—

On the origin of Cock-fighting.—After their victories over the Persians, the Athenians made a law, that one day in every year, there should be a public exhibition of a Cock-fight. When Themistocles led an army of his countrymen against the Barbarians, he saw two Cocks fighting. The spectacle was not lost upon him. He made his army halt, and thus addressed them:—"These Cocks (said he,) are not fighting for their country, or their paternal gods, nor do they endure this for the monuments of their ancestors, for the sake of glory in the cause of liberty, or for their offspring. The only motive is, that one is determined not to yield to the other."

These words animated the Athenians, and what was then an incentive to their valor, was preserved as a monument which might lead to the perpetration of similar exploits.

We do not known whether the information will be of any importance to modern Cock-fighters, but we have the authority of Xenophon for asserting, that the Athenians fed their Cocks with grains of pepper to make them more irrascible. —*Raleigh Register.*

—

Potash from the Beet.—M. Dubunfaut, a French chimist, has discovered that the beet after extracting the sugar and molasses, will yield good potash, but whether from the residium of the molasses, after distillation, or from the pomice we do not understand. The produce is about one pound from a hundred pounds of the beet root. At this rate of yield, the beet annually manufactured into sugar in France would afford about 15,000,000 pounds potash, worth from eight to nine millions of francs, or from one and a half to one and thee quarters millions of dollars. So say the prints.

—

Sewing Silk.—The manufacture of American Sewing Silk is become important, and the article is obtaining the best reputation. The Silk company at Northampton, are manufacturing at the rate of $200 per day, and yet cannot supply the demand. We are pleased to learn that a Company has been incorporated to grow and manufacture the same article in West Springfield.—*Northampton Cou.*

—

How to remove a Potato from the throat of a choking Cow.—Fasten the head of the animal, standing, firmly to a post. Let a strong man with his hand, completely stop the windpipe by his grasp just above the potato, and keep a firm hold

for a minute or two, until the animal gives an involuntary spring forward. Should the first experiment not succeed, let more be made. Reason; the wind obstructed in its passage through the wind-pipe, expands or largely opens the other pipe below the potato, and when the animal makes a violent effort, the pototo goes downwards. This is a fact worth knowing to farmers, and upon inquiry I find that a few do know it. I had a fating cow thus choking with a potato. After trying in vain several methods commonly known, I sent for a butcher to kill the cow at once. He came, but instead of killing, in a few moments relieved the creature in the manner I have described; and informed me that in the same way he had saved a number of cattle before.—*Yankee Farmer.*

A new construction of Railways.—Mr. Perkins has just exhibited a new plan of railways, which he has secured by patent, and which from the explanation given by him, would appear calculated to supply the desideratum so long desired, and indeed appears to form an era in the progress of those great national undertakings towards perfection. The plan embraces two modes of construction, founded on one commmon principle, viz. the continuous support of the rails. In the one case this is effected by blocks of vitrified earth, as hard and durable as granite, and which lock into one another, being laid on a concrete foundation; and in the other by an additional depth of concrete supplying the place of sleepers altogether. Upon the former plan, wooden bearers, four inches in the base, four thick, and two wide, on the top, rest upon the virtified blocks; and in the latter, upon the concrete, to which they are firmly secured. In both cases, iron bars, with the means afforded for expansion and contraction, are fixed on the wooden beams, and the foundation being continuous and solid, in fact like one block of granite the whole length of the road, no vibration is felt, as the numerous persons who rode in the wagon unanimously testified; and this is an important attainment in railway constructions. The saving by the plan first described will, it is stated, be full £4000 per mile, in four rows; and by the latter, very much more; in fact so enumerous will it be, as to give a new feature to railways, and astonishingly facilitate their construction in all parts of the country. We should much like to see it in practice, which is alone the test: so fallacious are frequently found to be the results when based alone on novelty and experiments.—*Mining Journal.*

New Lamp.—A lamp of a new construction, which describes a circle of light of about thirty feet in diameter, of the apparant intensity of sunshine, showing the objects within its sphere as distinctly as on the table of a camera obscurn, has been erected at the head of the inclined plane in St. Leonard's depot. Its object is to enable the engine-men to have a distinct view of the inclined ropes during the night, and this has been fully attained. The lamp consists of an Argand burner, placed in the focus of a large speculum, of a peculiar form, by which the whole light is distributed just on the space where it is required. It is computed that the light on the above space is equal to that of twenty-five or thirty similar burners in common lamps. A lamp of this kind we have no doubt would be useful for other purposes. It appears to us that the largest assembly-room might be brilliantly lighted by one placed at each end of the room, and one would be sufficient to light the stage of a theatre. The cost of this one is said to be about £200 but we understand it saves an annual expense of about half that sum. The inventer is a Mr. Rankin, and names it the conoinal lamp, probably because the light is thrown from it in the form of a cone.—*Caledonian Mercury.*

Speed the plough.—The New-York Commercial states, that at the last meeting of the American Institute, it was resolved that the ploughs in possession of the Institute, should be tested in a public manner, and under the inspection of farmers, selected for their practical skill in husbandry; and a committee was appointed to fix on a time and select a proper place—who reported in favor of Gen. Jeremiah Johnson's farm on Long Island as the place, and Friday the 28th day of April, as the time when the decision will be made respecting the merits of the different ploughs. It certainly is important that the kind of plough best adapted in its construction to the use of the farmer, should be generally known.

ERRATUM.

Page 285, line 6 from bottom, for "no manuring" read, "high manuring."